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ABSTRACT

This teacher's guide is designed to facilitate use of the West Virginia floriculture competency-based education (CBE) curriculum by instructors in floriculture programs. The curriculum is organized into 13 learning units, correlated with specific competencies. Each competency includes a learning checklist, learning activities, and evaluative standards. Where appropriate, student quizzes, work sheets, and information sheets are included. In order to aid the teacher, the accompanying teacher's guide contains an explanation of the curriculum and suggested usage; a list of competencies, by job title; suggested unit tests; and a list of references to accompany the curriculum. Appendixes to the guide contain data and information on tasks currently performed and equipment used, as determined from a validation survey of educators and persons employed in floriculture, and lists of curriculum aids currently used in West Virginia floriculture programs. Job titles covered in the curriculum include field inspector for disease and insect control; irrigator; supervisor of insect and disease inspection; flower picker; bulb sorter; supervisors of rose grading and horticulture; specialty growers; plant propagator; harvest contractor; cashier-wrapper; farmworker; telephone order clerk; salesperson for flowers or florist supplies; floral designer; florist; and manager of a retail store. (KC)

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TEACHER'S GUIDE

for

COMPETENCY-BASED EDUCATION CURRICULUM

for

FLORICULTURE

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PREFACE

It is with great pleasure that we bring you another West Virginia competency based education (CBE) curriculum. This competency based Floriculture Curriculum was developed under contract for West Virginia. The effort was coordinated by staff of the West Virginia Bureau of Vocational, Technical and Adult Education.

This document is organized into thirteen learning units. The learning units and the competencies for each are given in the table of contents. Each competency includes a learning checklist, learning activities, and evaluative standards. Where appropriate, student quizzes, work sheets, and information sheets are included.

The competency based Floriculture Curriculum was disseminated to West Virginia agriculture instructors at six regional inservices conducted in January, 1981. Additional copies of this curriculum are available from the:

Vocational Curriculum Laboratory
Cedar Lakes Conference Center
Ripley, West Virginia 25271
Telephone: 372-8673 or
in-state toll free 1-800-642-2670

I trust this material will be of assistance in your program. Any suggestions you may have for improving this curriculum may be sent to our state Curriculum Lab. Through this feedback we plan to continually update and revise our materials.

VOCATIONAL, TECHNICAL AND ADULT EDUCATION

Clarence E Burdette

Clarence E. Burdette
Assistant State Superintendent of Schools

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The planning, organizing, and coordinating of the development of this competency-based curriculum for Floriculture required the working together of many people of specialized skills and abilities. Associated Educational Consultants, Inc., (AEC) relied heavily on Mr. Donald Michael, Supervisor of Vocational Agriculture for the West Virginia Bureau of Vocational, Technical and Adult Education, for direction and assistance.

A knowledgeable and interested Task Force composed of West Virginia teachers contributed significantly in providing professional advice on content and procedure. Mr. William West, formerly of the Bureau of Vocational, Technical and Adult Education, assisted Mr. Michael in identifying and coordinating the Task Force. AEC greatly appreciates the help provided by those vocational agriculture teachers who served on the Task Force: Mr. Robert Beard, Parkersburg South High School; Mr. James Daugherty, James Rumsey Vocational-Technical Center; Mr. Arthur Hill, Mason County Vocational-Technical Center; and Mr. Harold Jones, John Marshall High School.

Special appreciation is extended to Dr. Fred W. Harrington, Coordinator of Curriculum Development, Bureau of Vocational, Technical and Adult Education, who aptly and patiently handled the arrangements for the many details of the project.

A number of people provided helpful suggestions and assisted in various ways at the several stages of the project. Particular recognition is due Mr. James Daugherty who not only gave of his time on the Task Force, but also served as a Content Consultant, writing Learning Activities for identified competencies. Special assistance was provided by another Content Consultant, Mr. Kenneth Keller, Hampton Township Senior High School, Allison Park, Pennsylvania. Mr. John Antonucci, president of the wholesale/retail North Side Floral, Inc., of Pittsburgh, Pennsylvania, and owner of the North Side Floral Shoppe, also of Pittsburgh, assisted by providing valuable advice and an open door to AEC staff as they investigated competency areas to be developed in the retail and design segment of the curriculum.

A debt of gratitude is owed also to those many people who took time from their busy schedules to respond to the task validation survey: teachers of vocational agriculture, both horticulture and floriculture, in West Virginia and Pennsylvania, and people in both states who are engaged in growing and selling floral products.

TEACHER'S GUIDE

INTRODUCTION

This teacher's guide is designed to accompany the Floriculture Competency-Based Education (CBE) Curriculum. It has been developed to facilitate use of the curriculum by instructors of Floriculture programs.

The Teacher's Guide contains: an explanation of the curriculum and suggested usage; a list of competencies, by job title; suggested unit tests; and a list of references to accompany the curriculum. The appendices contain data and information on tasks currently performed and equipment used, as determined from the validation survey, and lists of curriculum aids currently used in West Virginia Floriculture programs.

The competency sheets and packets, or instructional modules, in the Student Material for Floriculture may be used by either students or instructors, depending on your teaching style.

In order to assure that tasks specified in the Floriculture catalog conformed with current practices in West Virginia and a neighboring labor market (Pennsylvania), a survey was conducted. People employed as florists, greenhouse owner-operators and flower growers, and teachers in floriculture programs were surveyed to validate the lists of tasks and equipment. This curriculum, then, is built around the tasks which are actually performed by incumbent workers in the floral industry.

A copy of the data collected through the survey appears in this Teacher's Guide as Appendix A. You may find this data useful in working with your own advisory committee. The data are reported according to (1) state responses (West Virginia and Pennsylvania), (2) years of service in the occupation (1-5 years, 6-10 years, and more than 10 years), which can be helpful in determining entry level requirements, and (3) occupation of the respondent (flower grower, retail florist, and educator). You will note that there are some differences between the responses of the various groups in regard to time spent performing a task. Time spent will vary according to labor market needs and should be of particular importance in your instructional planning.

You should also note that there are lists of additional tasks performed, included as Appendix B. These were noted by respondents in relation to invitations to list any tasks not appearing on the survey. Be advised that some of these "tasks" may actually be steps which are a part of the Performance Checklists on the Student Competency Sheets of the curriculum; however, the respondents' statements are included as an appendix because the respondents felt they were important enough to list.

USES OF THE
FLORICULTURE
COMPETENCY-BASED EDUCATION CURRICULUM

Curriculum Purpose

This competency-based education (CBE) curriculum, with Teacher's Guide, has been developed so that you may adapt any or all of its contents to accommodate your teaching style.

The purpose of the CBE curriculum is to provide you and your advisory committee with a set of West Virginia-validated Floriculture Tasks, along with (1) the Steps needed to perform each task, (2) the Evaluation Standards, and (3) suggested Learning Activities.

Depending on your teaching style, you may want to use this material primarily to assist you in your own teaching plans, or the material has been developed in enough detail so that it may, with proper supervision, be used by your students.

How you use this CBE curriculum is up to you. It has been based on the best Floriculture information and material available in 1978-79 in West Virginia and in the United States.

Curriculum Design

The Student Competency Sheet (SCS) format has been designed for easy readibility. The Duty, or unit of instruction, is noted at the top of each page, followed by a Module title (a group of related Tasks within a Duty), and an identifying Task statement (the name of the SCS). Each Task packet is keyed; for example, I-A-1, which indicates Duty I, Module A, Task 1. Any subsequent related pages are keyed, in the upper right-hand corner, as $\frac{\text{I-A-1}}{2}$, $\frac{\text{I-A-1}}{3}$, $\frac{\text{I-A-1}}{4}$, etc.

The first major section of the SCS is a *Performance Checklist*, sometimes referred to as Performance Guide or "teaching steps." These are the steps necessary to accomplish performance of the stated Task. Learning Activities are geared toward enabling the student to perform each of the steps and to *understand* how and why they are done. Each Performance Checklist may be used by you as an evaluative aid. The Performance Checklist may be used as both a pre-test and a post-test for professional evaluation in relation to the Standard.

The mid-section of the SCS, the *Test*, is laid out to define the traditional performance objective in more easily identifiable terms. The "Test" has been divided into three (3) sections. The first, *Items Needed*, tells exactly what equipment, etc., must be collected to perform the task. You probably will want to review these items to be sure that the listing is specific enough, that all are available in the classroom, and/or that there are not omissions of items required to perform the task according to local procedures. The second section, *Task*, is an itemized statement of just what the student must do to demonstrate accomplishment of the required skill. The third section, *Standard*, indicates how well or to what degree the skill must be demonstrated. You have the option of modifying the standard to the degree that it meets local needs.

The last section of the SCS is *Learning Activities*, those learning experiences which will help the student to achieve competence in each step of the Performance Checklist. Here are listed the recommended readings in books most commonly available in, or to, State programs. Where such readings are not included in the standard texts, other recommended sources are provided. If the recommended books are not available in your school, you should substitute similar materials. Likewise, where procedural learning activities can be added or substituted according to available resources or your experience with student needs, they should be freely added.

If you wish to supplement the SCS Learning Activities, the list of kinds of activities shown on the following page may be useful to you.

Learning Activities

Audio tape
Brainstorming
Bulletin board
Buzz groups
Chalk board

Committees
Community study
Computer
Debates
Demonstration

Discovery
Discussion
Displays
Dramatizations
Drill and practice

Exhibits
Field trips/research
Film loops
Films
Filmstrips

Flannel boards
Flipchart
Games
Graphics
Homework assignment

Illustrated talk
Independent study
Information sheets
Investigation/reporting
Laboratory work

Large-group/small-group instruction
Library research
Listening
Listing or diagramming
Models

Oral recitation
Panels/symposiums
Problem solving
Programmed materials
Projects

Questions and answer
Reading out loud
Real objects
Resource persons
Review

Role playing
Simulation
Slides
Speaking
Step-by-step procedure panels

Supervised study
Team teaching
Television
Transparencies
Verbal illustrations

Videotape
Visual illustrations
Work-study
Writing

DEFINITION OF TERMS

COMPETENCY	A knowledge, skill, or judgment which the learner will demonstrate at a pre-determined level.
DUTY (UNIT)	A major segment of work comprising related tasks; one of the major activities involved in the work performed.
LEARNING ACTIVITIES	Activities and resources which will assist the learners in mastering the competencies. Learning activities can range from large group activities to small group activities to individual activities.
MODULE	(1) A group of related tasks within a unit. (2) An instructional packet consisting of Student Competency Sheet, Information Sheets and/or Self-Check Tests and/or Performance Check Sheets (rating sheets).
OCCUPATIONAL SURVEY	The procedure for collecting data to identify the duties and tasks that comprise one or more jobs, job types, or career field ladders, for the collection and analysis of information concerning such duties.
PERFORMANCE CHECKLIST/ PERFORMANCE GUIDE	A series of steps arranged in a sequence ordinarily followed which, when completed, may result in the performance of a task. Also called "teaching steps."
PERFORMANCE OBJECTIVE	(See also "Test.") A statement in precise, measurable terms of a particular behavior to be exhibited by a learner under specified conditions.
TASK	A unit of work activity which constitutes logical and necessary steps in the performance of a duty. A task has a definite beginning and ending point in its accomplishment and generally consists of two or more definite steps.
TASK ANALYSIS	The process of reviewing elements of a job for the purpose of improving training program content across program levels of vocational-technical education.

TEST	The measurement of a student's ability to perform all steps necessary to complete a task satisfactorily, as measured by instructor evaluation of pre-determined levels. (1) Test, as identified on Student Competency Sheets, consists of elements which indicate the condition, or testing situation, confronting the learner under specified conditions and the specific behavior expected. "Test" is composed of three parts: Items needed to perform the task, Task (what must be done to demonstrate competence), and Standard (how well, or to what standard, the skill must be demonstrated). (2) A teacher-graded evaluation of the student's written demonstration of cognitive performance.
STANDARD	The specific level of performance or quality of product which is acceptable for an entry level skill; reflects a consensus from knowledgeable people in the occupation.

USE OF COMPETENCIES

BY

JOB TITLE

COMPETENCIES BY JOB TITLE

Upon satisfactory completion of the specified competencies, students will be prepared to work in the following occupations, as described in the Dictionary of Occupational Titles, 4th Edition. The lists of competencies, however, should be carefully reviewed to assure compliance with local job market requirements.

Successful preparation for all occupations will include the following competencies:

1. Look for a job
2. Write a personal data sheet (resume)
3. Complete a job application form
4. Prepare for a job interview
5. Understand yourself
6. Understand successful work attitudes
7. Use principles of human relations

I. PLANTING AND GROWING OF FLORAL CROPS

Group A

1. Field Inspector, Disease and Insect Control: a person who inspects fields to determine presence of insect pests and plant diseases.

   Suggested competencies to be completed:

   1. Take soil samples
   2. Analyze soil samples to determine pH levels
   3. Analyze soil samples to determine soluble salts content
   4. Shred planting media
   5. Screen planting media
   6. Report disease and insect damage
   7. Identify and report spray damage

2. Irrigator, Sprinkling System: a person who tends sprinkling systems to irrigate land.

   Suggested competencies to be completed:

   1. Set time clocks for automatic mist propagation system
   2. Repair broken pipes, sprinkler heads, mist heads and/or valves
   3. Set time control valves (clocks)

4. Regulate overhead irrigation system (time clocks)
5. Regulate trickle irrigation system (ooze system)
6. Replace valves on irrigation system
7. Replace gaskets on irrigation system
8. Hand irrigate plants (hand watering)

Group B

The following occupational titles require proficiency in worker supervision and in the performance of related tasks identified in Group A:

1. Supervisor, Insect and Disease Inspection: a person who directs the activities of workers engaged in insect and plant pest detection and treatment.

2. Irrigator, Head: A person who coordinates workers engaged in watering crops.

Group C

1. Flower Picker: A person who harvests flowers, working as a member of a crew.

   Suggested competencies to be completed:

   1. Cut flowers
   2. Count and bunch flowers
   3. Prepare and place cut flowers in water or preservative
   4. Place plants (floral and foliage) in storage

2. Bulb Sorter, Flower Grader: a person who works as a crew member in sorting flowers and bulbs according to grade, color, and size and places produce in containers or on conveyors.

   Suggested competencies to be completed:

   1. Cut flowers
   2. Count and bunch flowers
   3. Prepare and place cut flowers in water or preservative
   4. Place plants (floral and foliage) in storage
   5. Treat bulbs or corms to control fungi or other disease organisms
   6. Remove salable plants from beds or benches
   7. Load potted plants for hauling
   8. Grade potted flowers or foliage plants
   9. Grade cut flowers
   10. Prepare invoices and shipping labels
   11. Package orders for shipment
   12. Load potted plants for hauling
   13. Inventory plants

3. Supervisor, (Rose) Grading: a person who supervises workers engaged in grading flowers according to size and appearance and directs the shipment of graded flowers to fill customers' orders.

   The competencies of Bulb Sorter, Flower Grader are necessary for this position in addition to proficiency in worker supervision.

Group D

Depending on the size and complexity of the establishment's operations, the following competencies may apply to:

1. Farmworker, Bulbs: a person who plants, cultivates and harvests flower bulbs in fields and in greenhouse structures.

2. Horticultural Worker II: a person who prepares growth media, under close supervision, and plants, sprays, weeds and waters plants, (shrubs and trees).

3. Horticultural Worker I: a person who plants, cultivates, and harvests horticultural specialties, such as flowers (and shrubs), and performs related duties in environmentally-controlled structures or in the fields.

    1. Take soil samples
    2. Analyze soil samples to determine pH levels
    3. Analyze soil samples to determine soluble salts content
    4. Shred planting media
    5. Screen planting media
    6. Mix media materials
    7. Sterilize (pasteurize) prepared media with steam
    8. Mix fertilizers into media
    9. Sterilize (pasteurize) soils
    10. Apply lime and/or fertilizer
    11. Till land
    12. Disc land
    13. Level or smooth fields
    14. Mark off location of beds
    15. Shape or form beds
    16. Mark off planting spaces with bedwire
    17. Regulate temperature of cold storage unit
    18. Set time clocks for automatic mist propagation system
    19. Plant bulbs
    20. Plant seeds
    21. Transplant seedlings
    22. Take cuttings
    23. Stick cuttings
    24. Remove rooted cuttings
    25. Transplant cuttings
    26. Label plants or cuttings
    27. Install shade cloth

28. Apply shading compound or paint to greenhouse glass
29. Install black cloth to regulate photoperiod
30. Provide the required light intensity for photoperiod control
31. Regulate time clocks
32. Adjust or control temperature (air conditioning, vents, or fans)
33. Check and maintain heating systems
34. Repair broken pipes, sprinkler heads, mist heads and/or valves
35. Force bulbs (control temperature, moisture, and light)
36. Raise or elevate bedwire
37. Apply growth regulating chemicals
38. Apply granular fertilizer
39. Apply liquid fertilizer
40. Locate and report any malfunctions of fertilizer injection system
41. Cultivate (till) soils
42. Aerate compacted soils in beds
43. Stake and tie plants
44. Pinch flowering plants
45. Disbud flowering plants
46. Prune plants
47. Set time control valves (clocks)
48. Regulate overhead irrigation system (time clocks)
49. Regulate trickle irrigation system (ooze system)
50. Replace valves on irrigation system
51. Replace gaskets on irrigation system
52. Hand irrigate plants (hand watering)
53. Report disease and insect damage
54. Remove dead and diseased plants
55. Remove dead and diseased plant parts
56. Remove weeds manually from potted plants
57. Remove weeds manually from floral crops
58. Repair lines and nozzles on spray equipment
59. Mix chemicals
60. Apply chemicals
61. Clean spray equipment after use (nozzle, tanks, hoses, etc.)
62. Identify and report spray damage
63. Set out poisoned bait to eradicate rodents
64. Cut flowers
65. Count and bunch flowers
66. Prepare and place cut flowers in water or preservative
67. Place plants (floral and foliage) in storage
68. Treat bulbs or corms to control fungi or other disease organisms
69. Remove salable plants from beds or benches
70. Remove bedwire from harvested areas
71. Sanitize production area
72. Load potted plants for hauling
73. Inventory plants

Additional maintenance, repair, and construction competencies that may be required are:

74. Grease equipment
75. Oil electric motors
76. Sharpen hand tools
77. Prepare and paint equipment
78. Make minor electrical repairs
79. Repair wooden greenhouse benches
80. Paint greenhouse frames and other structures
81. Replace and glaze broken greenhouse lights
82. Replace plastic covering on greenhouse structures
83. Repair wooden portions of the greenhouse superstructure
84. Replace damaged sections of saran
85. Replace damaged support wires for saran or black cloth
86. Construct greenhouse
87. Construct cold frame
88. Construct hot bed
89. Construct lath house

Group E

Experienced workers in some establishments may be engaged in supervisory positions classified in the *Dictionary of Occupational Titles* as:

1. *Plant Propagator*: a person who reproduces plants from cuttings and monitors plant growth, giving instructions to co-workers to assure the best growing procedures.

2. *Horticultural Specialty Grower, Field*: a person who reproduces and grows special crops, inspects fields to check crop development, and supervises field workers in planting, irrigating, weeding and harvesting activities.

3. *Horticultural Specialty Grower, Inside*: a person who grows flowers and ornamental plants under environmentally-controlled conditions, and supervises greenhouse workers.

It is suggested that a student aspiring to these positions be proficient in all competencies listed in Group D, plus the following:

1. Scheduling
2. Grade potted flowers or foliage plants
3. Grade cut flowers
4. Prepare invoices and shipping labels
5. Package orders for shipment
6. Order supplies

4. Supervisor, Horticultural Specialty Farming: a person who coordinates the work of crews engaged in growing and harvesting horticultural specialties in fields and greenhouses and trains new employees in gardening techniques. May also be designated as Greenhouse Superintendent.

   This position would require all the competencies of Group D, plus:

   1. Scheduling
   2. Grade potted flowers or foliage plants
   3. Grade cut flowers
   4. Prepare invoices and shipping labels
   5. Package orders for shipment
   6. Order supplies
   7. Establish prices for retail items
   8. Provide information to customer or recipient
   9. Register sale of merchandise
   10. Deliver merchandise

   Additional useful competencies would be:

   1. Select cut flowers
   2. Select cut foliage
   3. Select flowering plants
   4. Select foliage plants
   5. Condition cut flowers and foliage
   6. Store cut flowers
   7. Inspect potted plants for pests and damage
   8. Provide environmental care for potted plants
   9. Select advertising media
   10. Prepare advertising copy and layout
   11. Arrange showroom displays
   12. Design and locate special indoor displays
   13. Design and locate outdoor displays

5. Harvest Contractor: a person who provides harvest crews for flower growers, preparing estimates of the cost of completing the job, such as planting, pruning, weeding and harvesting crops.

   The experienced floriculturalist who wishes to engage in this specialized service should be able to demonstrate proficiency in the competencies shown in Groups D and E, as well as in worker supervision. Additional suggested competencies from this curriculum are included in:

   1. Order supplies
   2. Establish prices for retail items
   3. Provide information to customer or recipient
   4. Register sale of merchandise
   5. Place or receive orders through wire services
   6. Deliver merchandise

II. RETAIL FLORAL SHOP - DESIGN, SALES AND MANAGEMENT

The following Dictionary of Occupational Titles job classifications apply to persons employed in retail floral shops:

Group A

1. Cashier-Wrapper: a person who computes and records total sale and wraps merchandise for customers.

   Suggested competencies to be completed:

   1. Register sale of merchandise
   2. Package orders for shipment
   3. Decorate (dress) potted plants

   Additional suggested competencies for this occupation are included in:

   1. Prepare invoices and shipping labels
   2. Load potted plants for hauling
   3. Inventory plants

2. Telephone Order Clerk: a person who takes orders for floral merchandise over the telephone, informing customer of price, shipping date, varieties of merchandise available.

   Suggested competencies to be completed:

   1. Provide information to customer or recipient
   2. Place or receive orders through wire services

   Additional suggested competencies for this occupation are included in:

   1. Select cut flowers
   2. Select cut foliage
   3. Select flowering plants
   4. Select foliage plants
   5. Provide environmental care for potted plants
   6. Register sale of merchandise
   7. Deliver merchandise
   8. Prepare invoices and shipping labels
   9. Package orders for shipment
   10. Inventory plants

Group B

1. Salesperson, Flowers: a person who sells natural and artificial flowers and accessories, advising customer regarding type of flowers suitable for special occasions. Arranges displays of flowers and decorative accessories.

2. **Salesperson, Florist Supplies:** a person who sells florist supplies, such as artificial flowers, vases, ribbon, and wire, performing duties similar to those of the retail floral salesperson.

Competencies to be completed:

1. Label plants or cuttings
2. Regulate temperature of cold storage unit
3. Adjust or control temperature (air conditioning, vents, or fans)
4. Stake and tie plants
5. Pinch flowering plants
6. Disbud flowering plants
7. Prune plants
8. Hand irrigate plants (hand watering)
9. Report disease and insect damage
10. Remove dead and diseased plants
11. Remove dead and diseased plant parts
12. Remove weeds manually from potted plants
13. Cut flowers
14. Count and bunch flowers
15. Prepare and place cut flowers in water or preservative
16. Place plants (floral and foliage) in storage
17. Grade potted flowers or foliage plants
18. Grade cut flowers
19. Prepare invoices and shipping labels
20. Package orders for shipment
21. Load potted plants for hauling
22. Inventory plants
23. Select cut flowers
24. Select cut foliage
25. Select flowering plants
26. Select foliage plants
27. Condition cut flowers and foliage
28. Store cut flowers
29. Inspect potted plants for pests and damage
30. Provide environmental care for potted plants
31. Decorate (dress) potted plants
32. Order supplies
33. Arrange showroom displays
34. Design and locate special indoor displays
35. Design and locate outdoor displays
36. Provide information to customer or recipient
37. Register sale of merchandise
38. Place or receive orders through wire services
39. Deliver merchandise

Additional suggested competencies are:

1. Mix media materials
2. Mix fertilizers into media
3. Plant bulbs

4. Plant seeds
5. Transplant seedlings
6. Take cuttings
7. Stick cuttings
8. Remove rooted cuttings
9. Apply growth regulating chemicals
10. Apply granular fertilizer

Group C

1. Floral Designer, Florist: a person who designs and fashions live, cut, dried, and artificial floral and foliar arrangements to customer's order, after conferring with customer on type and price or merchandise desired. May also conduct classes or demonstrations and instruct co-workers. May also be designated as Floral Arranger, if arranging according to standard designs or under the direction of a Floral Designer.

   Competencies to be completed:

   1. Cut flowers
   2. Count and bunch flowers
   3. Prepare and place plants (floral and foliage) in storage
   4. Grade cut flowers
   5. Package orders for shipment
   6. Load potted plants for hauling
   7. Select cut flowers
   8. Select cut foliage
   9. Select foliage plants
   10. Condition cut flowers and foliage
   11. Store cut flowers
   12. Decorate (dress) potted plants
   13. Design and locate special indoor displays
   14. Design and locate outdoor displays
   15. Design vase arrangements
   16. Design body flowers
   17. Design hand arrangements
   18. Design baskets
   19. Design blankets and sprays
   20. Design wreaths and swags

Group D

1. Manager, Retail Store: a person who manages a retail store engaged in selling floral products and accessories, including preparing work assignments for employees, formulating prices, and coordinating sales promotion activities and accounting procedures.

   Competencies to be completed:

1. All competencies of Groups A, B, and C
2. Establish prices for retail items
3. Select advertising media
4. Prepare advertising copy and layout

FLORICULTURE CURRICULUM

TABLE OF CONTENTS

DUTY MODULE TASK

A. Employment Opportunities

  1. Look for a job
  2. Write a personal data sheet (resume)
  3. Complete a job application form
  4. Prepare for a job interview

B. Human Relations

  1. Understand yourself
  2. Understand successful work attitudes
  3. Use principles of human relations

I. Preparation of Soils and Planting Media

  A. Soil Analysis

    1. Take soil samples
    2. Analyze soil samples to determine pH levels
    3. Analyze soil samples to determine soluble salts content

  B. Media Preparation

    1. Shred planting media
    2. Screen planting media
    3. Mix media materials
    4. Sterilize (pasteurize) prepared media with steam
    5. Mix fertilizers into media

  C. Land preparation

    1. Sterilize (pasteurize) soils
    2. Apply lime and/or fertilizer
    3. Till land
    4. Disc land
    5. Level or smooth fields

  D. Developing Beds

    1. Mark off location of beds
    2. Shape or form beds
    3. Mark off planting spaces with bedwire

DUTY MODULE TASK

II. Propagation and Planting of Plants

A. Environmental Mechanisms

1. Regulate temperature of cold storage unit
2. Set time clocks for automatic mist propagation system

B. Seeds and Bulbs

1. Plant bulbs
2. Plant seeds
3. Transplant seedlings

C. Cuttings

1. Take cuttings
2. Stick cuttings
3. Remove rooted cuttings
4. Transplant cuttings
5. Label plants or cuttings

III. Cultural and Environmental Control Practices

A. Physical/Mechanical Environmental Controls

1. Install shade cloth
2. Apply shading compound or paint to greenhouse glass
3. Install black cloth to regulate photoperiod
4. Provide the required light intensity for photoperiod control
5. Regulate time clocks
6. Adjust or control temperature (air conditioning, vents or fans)
7. Check and maintain heating systems
8. Repair broken pipes, sprinkler heads, mist heads and/or valves
9. Force bulbs (control temperature, moisture and light)
10. Raise or elevate bedwire

B. Chemical Environmental Controls

1. Apply growth regulating chemicals
2. Apply granular fertilizer
3. Apply liquid fertilizer
4. Locate and report any malfunctions of fertilizer injection system

C. Soil Preparation

1. Cultivate (till) soils
2. Aerate compacted soils in beds

DUTY MODULE TASK

- D. Crop Care
    - 1. Scheduling
    - 2. Stake and tie plants
    - 3. Pinch flowering plants
    - 4. Disbud flowering plants
    - 5. Prune plants

IV. Irrigation Practices

- A. Mechanical Adjustments and Repairs
    - 1. Set time control valves (clocks)
    - 2. Regulate overhead irrigation system (time clocks)
    - 3. Regulate trickle irrigation system (ooze system)
    - 4. Replace valves on irrigation system
    - 5. Replace gaskets on irrigation system
- B. Water Application
    - 1. Hand irrigate plants (hand watering)

V. Plant Pest and Disease Control

- A. Identification of Pests/Diseases
    - 1. Report disease and insect damage
    - 2. Remove dead and diseased plants
    - 3. Remove dead and diseased plant parts
- B. Elimination of Weeds
    - 1. Remove weeds manually from potted plants
    - 2. Remove weeds manually from floral crops
- C. Chemical Treatment of Pests/Diseases
    - 1. Repair lines and nozzles on spray equipment
    - 2. Mix chemicals
    - 3. Apply chemicals
    - 4. Clean spray equipment after use (nozzle, tanks, hoses, etc.)
    - 5. Identify and report spray damage
    - 6. Set out poisoned bait to eradicate rodents

DUTY MODULE TASK

VI. Harvesting Crops

- A. Flowers
    1. Cut flowers
    2. Count and bunch flowers
    3. Prepare and place cut flowers in water or preservative
    4. Place plants (floral and foliage) in storage
- B. Bulbs and Corms
    1. Treat bulbs or corms to control fungi or other disease organisms
- C. Selection and Transportation
    1. Remove salable plants from beds or benches
- D. Post-harvest Bed Preparation
    1. Remove bedwire from harvested areas
    2. Sanitize production area

VII. Packaging, Storage and Shipment

- A. Grading
    1. Grade potted flowers or foliage plants
    2. Grade cut flowers
- B. Shipping
    1. Prepare invoices and shipping labels
    2. Package orders for shipment
    3. Load potted plants for hauling
- C. Inventory Control
    1. Inventory plants

VIII. Miscellaneous Maintenance and Repairs

- A. Equipment Maintenance
    1. Grease equipment
    2. Oil electric motors
    3. Sharpen hand tools
    4. Prepare and paint equipment
    5. Make minor electrical repairs

DUTY MODULE TASK

B. Greenhouse Repair and Maintenance

1. Repair wooden greenhouse benches
2. Paint greenhouse frames and other structures
3. Replace and glaze broken greenhouse lights
4. Replace plastic covering on greenhouse structures
5. Repair wooden portions of the greenhouse superstructure
6. Replace damaged sections of saran
7. Replace damaged support wires for saran or black cloth

IX. Constructing Greenhouses and Structures for Environmental Control

A. Greenhouse

1. Construct greenhouse

B. Other Growing Structures

1. Construct cold frame
2. Construct hot bed
3. Construct lath house

X. Selecting Plant Materials for Retailing

A. Cut Materials

1. Select cut flowers
2. Select cut foliage

B. Potted Plants

1. Select flowering plants
2. Select foliage plants

XI. Prolonging the Usefulness of Plant Materials

A. Cut Flowers

1. Condition cut flowers and foliage
2. Store cut flowers

B. Potted Plants

1. Inspect potted plants for pests and damage
2. Provide environmental care for potted plants

XII. Designing with Flowers and Decorative Materials

A. Design Arrangements

1. Design vase arrangements

DUTY MODULE TASK

2. Design body flowers
3. Design hand arrangements
4. Design baskets
5. Design blankets and sprays
6. Design wreaths and swags
7. Decorate (dress) potted plants

XIII. Merchandising

A. Establish Prices

1. Order supplies
2. Establish prices for retail items

B. Advertising

1. Select advertising media
2. Prepare advertising copy and layout

C. Displaying Merchandise

1. Arrange showroom displays
2. Design and locate special indoor displays
3. Design and locate outdoor displays

D. Maintaining Customer Relations

1. Provide information to customer or recipient
2. Register sale of merchandise
3. Place or receive orders through wire services
4. Deliver merchandise

TEACHER EVALUATION AIDS

AND

ANSWER KEYS

EVALUATION AIDS

PREFACE

Two types of "tests" are included in this curriculum: (1) performance tests, and (2) written tests, examples of which are provided in this section. You are cautioned against using any of the examples without adequate review and selection.

Performance Tests

The instructor may evaluate the student's ability to perform tasks to observable, recognized standards as he/she progresses through and/or concludes the steps of the Performance Checklist on the Student Competency Sheet (Student Materials book). A Performance Check Sheet is also provided with some Student Competency Sheets. The Performance Check Sheet allows a more definitive observation of the student's performance.

Written Tests

Written tests, examples of which are included in this section, may be administered to evaluate cognitive and sometimes affective learning:

1. To measure attainment of information as the student progresses through the learning activities related to a particular task (Student Competency Sheet);
2. At the conclusion of working through the learning activities of a Student Competency Sheet for a single task, or, combining several task tests, at the conclusion of a Module.
3. At the conclusion of a unit of instruction - a Duty test.
4. As a portion of a pre-test if the open entry/open exit system is used.

Some examples of Task Tests are shown. They are keyed according to Duty and Task. For instance, the test marked A-1 keys the test to Duty A, Task 1. You may use a Task Test as a teacher-graded test, or you may consider it more useful as a learning tool. Thus, you have the option of administering a written test and evaluating the answers or distributing the questions and answer key as a self-check test.

Also included are examples of Duty Tests. These are unit tests keyed to each of the Duties. They are indicated, for instance, as "Duty Test, Duty I--Preparation of Soils and Planting Media." These unit tests may be utilized to measure learning as related to the entire unit, or they may be altered, supplemented, or reduced to measure the learning of selected modules or tasks.

The format of a major examination is critical in the appropriate and valid measurement of learning. Likewise, the structure and format of a unit test should present the written examination as a learning tool and not be seen as unusual or unlike learning activities in which the student has participated. The tests presented here are divided into several parts to allow grouping by structure and to promote the use of example questions in units structured by the needs of a particular group of learners.

Teacher Evaluation

Duty A: EMPLOYMENT OPPORTUNITIES

Part I. True-False (20 points, two (2) for each correct answer)

Circle the correct answer:

1. T F The personal data sheet is often called a resume.

2. T F A personal data sheet includes more information than you'll need on a job application form or in an interview.

3. T F Personal references are a waste of time. Employers never call them anyhow.

4. T F Having a Social Security card guarantees that you'll be given a job.

5. T F You don't have to tell prospective employers whether you're single, married, or divorced.

6. T F A letter of application is written only if you apply for an office job.

7. T F It's sometimes all right to look at your pre-written list of questions to be asked and items to be discussed during the interview.

8. T F Emphasizing your own good points during an interview makes you appear to be conceited.

9. T F If the interviewer has not said "no," it's all right to call back in a week or two (2) to remind the interviewer that you're still interested.

10. T F You should put something in all the blanks on a job application form except those marked for company use.

Part II. Multiple Choice (20 points, two (2) for each correct answer)

Circle the correct answer (a, b, or c):

11. The D.O.T. number is:

    a. The code which describes a job.
    b. The projected number of employees needed in an occupational field.
    c. The telephone number of the Bureau of Employment Security.

Duty A Test (continued)

12. State licensing is not required:

    a. To be a medical doctor.
    b. To be a registered nurse.
    c. To be a greenhouse grower.

13. When writing out your work experience record:

    a. Start with the most recent job and work backward.
    b. Start with the first job and work toward what you have done most recently.
    c. The order of the jobs doesn't matter.

14. If the interviewer asks something you don't know or asks if you can do something you've never tried or cannot do, it's best to:

    a. Not answer at all.
    b. Fake it.
    c. Be honest.

15. In large businesses, the interviewer most likely:

    a. Hires the employees.
    b. Screens the applicants.
    c. Sets the wage or salary rate.

16. A floral designer:

    a. Is responsible for analyzing soil samples.
    b. Tills land.
    c. Assembles flowers and foliage into a specific design to express the sentiments of the sender.

17. Gross pay is:

    a. The amount that is taken home.
    b. The total amount paid before deductions.
    c. The hourly rate of pay.

18. A job application:

    a. Helps the interviewer judge your ability to follow directions.
    b. Usually asks for unimportant information.
    c. Tells nothing about you except the words that you have written.

Duty A Test (continued)

19. Salary should be discussed:
    a. First thing during the interview.
    b. At the end of the interview.
    c. Not at all.

20. Looking the interviewer in the eye is:
    a. A way to show you're listening and interested.
    b. Not necessary as long as you're listening.
    c. Rude.

Part III. Define (20 points, two (2) for each correct answer)

21. Fringe benefits
22. Ethnic group
23. Nationality
24. Marital status
25. Dependent
26. Management
27. Salary
28. Wage
29. Limitations
30. Deduction

Part IV. List five (5) entry-level occupations for which the Floriculture program will prepare you. (15 points, three (3) for each correct answer)

Part V. As described in the Dictionary of Occupational Titles, list the duties of:

1. Horticultural worker
2. Floral Designer

(25 points, to be evaluated by the instructor)

Answer Key - Teacher Evaluation

Duty A Test: EMPLOYMENT OPPORTUNITIES

I.	1.	True	6.	False	II.	11.	a	16.	c
	2.	False	7.	True		12.	c	17.	b
	3.	False	8.	False		13.	a	18.	a
	4.	False	9.	True		14.	c	19.	b
	5.	True	10.	True		15.	b	20.	a

III. 21. Things given an employee other than money.
22. Caucasian (white), negroid (black), Indian, Asian, other.
23. Country where a person is born.
24. Single, married, divorced, or widowed.
25. An individual who depends upon you for support.
26. Those who make decisions.
27. Monthly or yearly contract payments.
28. The hourly rate of pay.
29. Health or physical condition that may hinder a person on the job.
30. That which is taken from a pay check.

IV. 31 - 35. Floral Designer
Floral Arranger
Specialty Grower, Field
Specialty Grower, Inside
Plant Propagator
Farmworker, Bulbs
Horticultural Worker I, II
Budder
Field Inspector, Disease & Insect Control
Irrigator, Sprinkling System
Field Hauler
Flower Picker

V. List the duties of a Floral Designer and Horticultural Worker. (25 points, to be evaluated by the instructor. May be those listed in the Dictionary of Occupational Titles or from lecture by instructor. Must include all main duties.)

Teacher Evaluation

Duty B: HUMAN RELATIONS

Part I. True-False (20 points, four (4) for each correct answer)

Circle the correct answer:

1. T F The most important factor in job success is how well you perform the technical skills.

2. T F Morality is the value which has the greatest effect upon your personality.

3. T F Spoken defamation of character is called slander.

4. T F Personal hygiene and good grooming are related to good work habits.

5. T F Having to rely on another person for help or support of any kind makes a person unethical.

Part II. Multiple Choice (20 points, four (4) for each correct answer)

Circle the correct answer (a, b, c, or d):

6. A natural talent which makes it easy to learn certain things is:

   a. Ability
   b. Interest
   c. Aptitude
   d. Foresight

7. Having good manners and a true concern for the comfort of others is:

   a. Self-control
   b. Courtesy
   c. Tact
   d. Sense of humor

8. Being able to see both sides of a question or argument:

   a. Morality
   b. Open-mindedness
   c. Duplicity
   d. Initiative

Duty B Test (continued)

9. The ability to get along with others:

   a. Something you are born with
   b. Honesty
   c. Punctuality
   d. Learned

10. One's actions in general:

    a. Solvent
    b. Conduct
    c. Customs
    d. Hypothetical

Part III. Completion (20 points, four (4) points each)

Write the word that completes the statement in the blank to the left of the statement.

11. ____________________ A _____ acts as a bridge between the people who run the business and the employees.

12. ____________________ Your _____ is determined by how well your needs are satisfied, how others react to you and how closely you measure up to the ideal you have set for yourself.

13. ____________________ A _____ is an established pattern of behaving in relation to other people.

14. ____________________ _____ is the exchange of information, feelings, and ideas which is the basis for the development of relationships among people.

15. ____________________ If you can handle situations so that no one becomes offended and if you say the right thing at the right time, you possess _____.

Duty B Test (continued)

Part IV. 16. List seven (7) specific jobs in the floriculture field (28 points, four (4) points for each correct answer):

1.

2.

3.

4.

5.

6.

7.

Part V. 17. List three (3) specific settings in which floriculture workers can be employed (twelve (12) points, four (4) for each correct answer):

1.

2.

3.

Answer Key - Teacher Evaluation

Duty B Test: HUMAN RELATIONS

I. 1. False
2. False
3. True
4. True
5. False

II. 6. c
7. b
8. b
9. d
10. b

III. 11. Supervisor
12. Self-concept
13. Role
14. Communications
15. Tact

IV. 16. Any seven (7) of the following:

Floral Designer
Floral Arranger
Specialty Field Grower
Greenhouse Grower
Field Inspector
Plant Propagator
Farmworker, Bulbs
Horticulture Worker I, II

V. 17. Florist Shop
Greenhouse
Nursery

Teacher Evaluation

Duty B: HUMAN RELATIONS Task 1: Understand Yourself

Read the following list of words. Find the word which best fills in the blank in the corresponding statements. Place the letter in the blank provided at the left of the statement.

A. personal appearance
B. able
C. foresight
D. health habits
E. punctuality
F. tact
G. courtesy
H. attitude toward other people
I. dependable
J. sense of humor
K. self-control
L. open-mindedness
M. morality
N. honesty
O. initiative
P. aptitude

_____ 1. When we say that people have ability to do something, we mean they are ___________ to do it.

_____ 2. When people seem to be born with natural talent which makes it easy to learn certain things, we say that they have ___________ for these things.

_____ 3. The value which has the greatest effect upon your personality shows in your ___________.

_____ 4. ___________ means having two things: good manners and a true concern for the comfort of others.

_____ 5. People who always complete the work given them on the job are ___________.

_____ 6. To look and plan ahead displays ___________.

_____ 7. Good ___________ help you feel, act and look your best.

_____ 8. If you can see that things need to be done and do them, you have ___________.

_____ 9. Being able to see both sides of a question or argument means ___________.

_____ 10. Being on time describes ___________.

_____ 11. If you can see the funny side of life, you have a ___________.

_____ 12. If you can say the right thing at the right time, and handle situations so that no one becomes offended you possess ___________.

Answer Key - Teacher Evaluation

Duty B: HUMAN RELATIONS Task 1: Understand Yourself

1. B - able
2. P - aptitude
3. H - attitude toward other people
4. G - courtesy
5. I - dependable
6. C - foresight
7. D - health habits
8. O - initiative
9. L - open-mindedness
10. E - punctuality
11. J - sense of humor
12. F - tact

Teacher Evaluation

Duty B: HUMAN RELATIONS Task 2: Understanding Successful Work Attitudes

Answer each by circling "T" for true, or "F" for false. You must answer twelve (12) out of 15 correctly. No references may be used.

T F 1. The most important factor in job success is attitude.

T F 2. About two-thirds of the young workers who lose their jobs do so because of poor attitude.

T F 3. Those who are most agreeable to take on unpleasant tasks are often the first to be awarded with pay increases.

T F 4. It is not important to be friendly with your co-workers.

T F 5. If you cannot be loyal to your employer and your company, you should look for another job.

T F 6. Regardless of how a criticism was meant, it is constructive or destructive depending on how you use it.

T F 7. If you are too ill to go to work, it is best to stay home, and then let the employer know why you missed work as soon as you are well.

T F 8. It is not fair for an employer to criticize your work until you have had time to learn the job.

T F 9. Most employers like workers who follow directions exactly as given.

T F 10. The behavior we develop by the time we leave high school affects us for the rest of our lives.

T F 11. The ability to get along with others is something that you are "born with" - it can't be learned.

T F 12. Written evaluations of your work by your employer are legal.

T F 13. A sense of humor is the ability to laugh when the joke is on you.

T F 14. Criticism is necessary in the job situation.

T F 15. It is best to become close friends with a co-worker during the first week or two on the job.

Answer Key - Teacher Evaluation

Duty B: HUMAN RELATIONS Task 2: Understanding Successful Work Attitudes

1. T
2. T
3. T
4. F
5. T
6. T
7. F
8. F
9. T
10. T
11. F
12. T
13. T
14. T
15. F

Activity Sheet

Duty B: HUMAN RELATIONS Task 2: Understanding Successful Work Attitudes

"5-Minute Timed Test on Following Directions"

How well do you follow directions? You should be able to complete all the things required in five (5) minutes by following the directions below. Your teacher may wish to time you to see who can finish first, second, etc., so turn your paper over to show when you have completed all the work.

Do not begin until your teacher says "go," then follow directions exactly as given. You will need one (1) sheet of notebook paper.

1. Read all directions before doing anything.
2. On a sheet of notebook paper, write your name in the upper right corner.
3. Number from one (1) to seven (7), leaving three (3) blank lines between each number.
4. Draw five small squares beside the number one (1) on your paper.
5. Put an "X" in each square beside number one (1).
6. Put a circle around the number two (2) on your paper.
7. Count the number of pages in Chapter Four (4) of your book and write the answer beside number three (3) on your paper.
8. Multiply the answer above by your age.
9. Say your name out loud.
10. Beside number four (4), write today's date.
11. Beside number five (5), write the city and state where you were born.
12. Count the number of persons in the room and write the answer beside number six (6).
13. Say, "I have reached number 13, and I am following directions carefully."
14. Now that you have completed the reading, omit all directions except the first two (2).

Teacher Evaluation

Duty B: HUMAN RELATIONS Task 3: Using Principles of Human Relations

The following true/false questions deal with the Principles of Human Relations. Place a circle around the letter which represents the correct answer ("T" for true, or "F" for false):

T F 1. The ability to make things happen is important both in your social life and in your career.

T F 2. We do some things for no reason at all.

T F 3. We are more effective in our human relationships if we know why others behave as they do.

T F 4. Everything we do is because we want something.

T F 5. Adults are more self-centered than children.

T F 6. Human beings usually behave on the basis of what is logical.

T F 7. Everyone has some feelings of insecurity.

T F 8. Showing a sincere interest in someone can help you influence that person.

T F 9. Although a smile may be useful in your social life, it is of little value in your career.

T F 10. Putting up a good argument will help you influence others.

T F 11. Catching other people in the right mood is an important factor in making them behave as you would like.

T F 12. Once you can show that another person has made a mistake, it is important that you get him or her to admit it.

T F 13. Everyone has a basic need to feel important.

T F 14. It is easier to influence another with praise then with criticism.

T F 15. You can tell a great deal about a person by observing his or her mannerisms.

Answer Key - Teacher Evaluation

Duty B: HUMAN RELATIONS Task 3: Using Principles of Human Relations

1. T
2. F
3. T
4. T
5. F
6. F
7. T
8. T
9. F
10. F
11. T
12. F
13. T
14. T
15. T

Teacher Evaluation

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

1. Why is it necessary to take several subsamples to make a composite soil sample?
2. How does pH affect plant nutrients in the soil?
3. What is the most common material used to raise the pH of a soil?
4. Why should a soluble salts test be conducted every week for each greenhouse crop?
5. What should be done before growing a second crop in a greenhouse soil mix?
6. What are the reasons for sterilizing soil?
7. Why is it usually necessary to mix fertilizers into growing media?
8. What is the hardest problem in applying lime and fertilizer?
9. What are the two main reasons for plowing, discing, leveling, and smoothing a field?
10. List some crops that might be grown in planting beds?

Answer Key - Teacher Evaluation

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

1. To make sure that the sample is representative of the area to be tested.
2. pH affects the availability of nutrients to plants.
3. Lime.
4. To determine if fertilizer should be applied to the crop.
5. The soil mix should be shredded, screened, and sterilized.
6. To destroy harmful diseases, insects, and weed seeds.
7. Most greenhouse growing media are deficient in some plant nutrients.
8. Uniform application.
9. Weed control and seed bed preparation.
10. Flower gardens, cut flower crops, and vegetable transplants.

Teacher Evaluation

Duty II: PROPAGATION AND PLANTING OF PLANTS

1. A _______________ germination medium should always be used for planting seeds.

2. _______________ are placed in the containers or flats to serve as identification.

3. Spring flowering bulbs are planted in the _______________ of the year.

4. The medium should always be _______________ before sticking cuttings or planting seeds.

5. Cuttings are stored in _______________, _______________ conditions until they are stuck.

6. _______________ heat should always be used when starting seeds and cuttings.

7. A _______________-_______________ thermometer shows both the coldest and warmest temperature that a particular area has had.

8. Cuttings are usually _______________ to _______________ inches long.

9. A _______________ controls the temperature in a cold storage unit.

10. Rooted cuttings should always be handled by lifting them by their _______________.

11. Rooted cuttings and seedlings are always stuck at the _____________ depth which they were initially grown.

12. When inserting a label in a flat, the plants that it represents are in the _______________ of and to its _______________.

13. Always use a _______________ marking material when labeling.

14. The medium must be _______________ around cuttings and seedlings after inserting them.

15. A _______________ _______________ is used to help initiate roots on a cutting.

16. Seedlings are handled by picking them up carefully by the _________.

Answer Key - Teacher Evaluation

Duty II: PROPAGATION AND PLANTING OF PLANTS

1. Sterile
2. Labels
3. Fall
4. Moist or wet
5. Cool, moist
6. Bottom
7. Maximum-minimum
8. Three (3) to five (5)
9. Thermostat
10. Roots
11. Same
12. Back, right
13. Waterproof
14. Firmed
15. Rooting hormone
16. Leaves

Teacher Evaluation

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Directions: Circle the letter that best completes the statement.

1. The purpose of pruning is to:

   a. remove dead wood.
   b. remove diseased wood or create special tree forms.
   c. remove insect infested or broken wood.
   d. all of these reasons.

2. It is necessary to shade mums in the summer because:

   a. days are too long.
   b. temperatures are too high.
   c. heat tends to fade the flowers.

3. Plant size may be controlled by growth regulators such as:

   a. giberellic acid
   b. B-nine
   c. phosphon
   d. all of these

4. Bedwire is used to:

   a. make corsages.
   b. attach shadecloth to greenhouse.
   c. wrap plants for shipping.
   d. support greenhouse plants.

5. A light meter is used to:

   a. heat greenhouse plants.
   b. measure light intensity.
   c. measure plant growth.
   d. cool greenhouse plants.

6. Flowering plants are pinched back in order to:

   a. collect tips for replanting in the spring.
   b. make more but smaller flowers.
   c. make plants grow taller.
   d. discourage insects.

7. Differences between the desired times and the actual cycling time of time clocks in the greenhouse should be no more than:

   a. five minutes.
   b. ten minutes.
   c. three minutes.
   d. one hour

Duty III Test (continued)

8. A flower that has been disbudded will produce:

   a. a larger main flower than a flower that has not been disbudded.
   b. a smaller main flower than a flower that has not been disbudded.
   c. the same size flower as a flower that has not been disbudded.
   d. a different shape of petal.

9. Oil-burning field heaters are installed as a protection against:

   a. insects
   b. frost
   c. vandalism
   d. all of the above

10. The best time to shade a greenhouse is in:

   a. June
   b. October
   c. August
   d. December

Answer Key - Teacher Evaluation

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

1. d
2. a
3. d
4. d
5. b
6. b
7. a
8. a
9. b
10. a

Teacher Evaluation

Duty IV: IRRIGATION PRACTICES

1. A _______________ or _______________ is usually used in hand-watering plants.

2. Most plants have been watered sufficiently when water is observed coming from the _______________.

3. The irrigation cycle is set by adjusting the _______________ or _______________ to the required schedule.

4. The _______________ located on the round dial are moved to get the proper amount of water on a plant during a given cycle.

5. The _______________ or ooze irrigation system is used when water conservation must be kept in mind.

6. The ooze irrigation system must be adjusted while _______________.

7. When replacing valves, _______________ must be used on all threaded fittings.

8. _______________ are fibrous or rubber material between metal joints to make the joints water-tight.

Answer Key - Teacher Evaluation

Duty IV: IRRIGATION PRACTICES

1. Watering can, hose
2. Drainage holes
3. Time clocks, control valves
4. Timing stops
5. Trickle
6. Operating
7. Pipe compound
8. Gaskets

Teacher Evaluation

Duty V: PLANT PEST AND DISEASE CONTROL

True or False: Place a "T" or an "F" in the blank at the left of each statement.

_____ 1. Part of a leaf eaten away is a symptom of pest damage.

_____ 2. Moldy growth on a leaf is a symptom of insect damage.

_____ 3. Very small round dead spots in a leaf are indications of damage from sucking insects.

_____ 4. Diseased plants are removed from healthy plants to prevent spread of disease to other plants.

_____ 5. Weeds in a potted plant reduce its salability.

_____ 6. The part of a sprayer most subject to clogging is the pump.

_____ 7. A face shield must be worn when mixing a wettable powder chemical.

_____ 8. Accidental pesticide poisoning is most likely to occur during application.

_____ 9. A rubber spray suit is worn to prevent pesticide absorption through the skin.

_____10. Pesticide spray damage is usually caused by using too high a ratio of chemicals.

_____11. Burrows found in plant growing areas indicates the presence of rodents.

_____12. Pest control means 100% eradication.

_____13. The best way to kill plant disease is by burning infected plants.

_____14. The greatest advantage of removing dead leaves from plants before sale is increased sale value.

_____15. The best place to find pesticide application rates, safety precautions and container disposal directions is from a chemical salesman.

_____16. Sprayer calibration should be done with pesticide in the sprayer.

Duty V Test (continued)

_____17. "Sprayer calibration" means determining the amount of spray applied to a given area.

_____18. Before a pest can be controlled, it must be identified.

_____19. Coveralls are considered pesticide safety equipment.

_____20. A respirator prevents inhalation of pesticide fumes and dust.

_____21. Good pest control depends upon uniform spray application.

_____22. Nozzle clogging increases when using emulsifiable concentrates (E.C.).

_____23. Detergent should be used when cleaning petroleum-based pesticides from a sprayer.

_____24. Sprayer parts should not be lubricated after using acid and salt-based pesticides.

_____25. Rodenticides are used to control rats and mice.

Answer Key - Teacher Evaluation

Duty V: PLANT PEST AND DISEASE CONTROL

1. T
2. F
3. T
4. T
5. T
6. F
7. F
8. F
9. T
10. T
11. T
12. F
13. T
14. T
15. F
16. F
17. T
18. T
19. T
20. T
21. T
22. F
23. T
24. F
25. T

Teacher Evaluation

Duty VI: HARVESTING CROPS

True or False: Place a "T" or an "F" in the blank at the left of each statement.

_____ 1. Flowers should be harvested in the very early bud stage.

_____ 2. When bunching flowers, stems should be of varying lengths to provide buyer with several sizes in each bunch.

_____ 3. Using dividers or racks in containers prevents flowers from falling down and becoming submerged in the preservative.

_____ 4. Poinsettia plants thrive best in a dry environment.

_____ 5. Treated bulbs should be allowed to dry before being placed in storage to prevent bulb decay or rot.

_____ 6. Bedwire is used to support plants and produce straight stems.

Complete the statement:

7. Two methods of treating bulbs or corms to control fungi or other disease organisms are the _______________ method or the _____________ method.

8. When loading potted plants for hauling, _______________ should be used to secure the bulb of the shipment and to prevent plants from shifting.

9. Once the crops have been harvested, _______________ the production area is a good way to eliminate pests or diseased soil.

10. Cut flowers should be placed in a solution which covers not less than _______________ or more than _______________ the length of the stems.

Answer Key - Teacher Evaluation

Duty VI: HARVESTING CROPS

1. F

2. F

3. T

4. F

5. T

6. T

7. dust, dip

8. rope

9. sanitizing

10. 1/3, 1/2

Teacher Evaluation

Duty VII: PACKAGING, STORAGE, AND SHIPMENT

True or False: Place a "T" or an "F" in the blank at the left of each statement.

_____ 1. Under-mature flowers are those flowers which have been cut too soon and may never fully bloom or open.

_____ 2. A carnation with a split calyx would be an ideal flower to offer for sale.

_____ 3. Excelsior can be used to insulate flowers against cold temperatures during shipment.

_____ 4. When starting a perpetual inventory system in a shop, it is not necessary to take a physical inventory first.

_____ 5. Inventory control tells the retailer what is in stock and what needs to be ordered.

Complete the statement:

6. Another name for an invoice is a _______________.

7. The total price computed on an invoice for six (6) of the same item is called the _______________ price.

8. To reduce stock on hand before taking inventory, a retailer often conducts a _______________.

9. A physical inventory is usually taken when the shop is _______________.

10. The form which indicates where an order is to be sent is called a _______________ _______________.

Answer Key - Teacher Evaluation

Duty VII: PACKAGING, STORAGE, AND SHIPMENT

1. T
2. F
3. T
4. F
5. T
6. bill
7. extended
8. sale
9. closed
10. shipping label

Teacher Evaluation

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

1. Where can the correct lubricant information be found?
2. What is the benefit of equipment lubrication?
3. What can be used to sharpen hand tools?
4. What is the advantage of sharpening hand tools?
5. Why must equipment be clean to be painted?
6. Why is it important to clean paint application equipment?
7. What tool is used to test for the presence or absence of electricity?
8. How can electrical current be shut off to a work area?
9. What book should be used to insure that electric wiring is safe and done properly?
10. What makes electrical tools safer for the worker than regular tools?
11. Why is it beneficial to have raised benches in a greenhouse?
12. Why are greenhouse structures painted?
13. What is used to form a waterproof seal when replacing a broken greenhouse glass?
14. How does the cost of polyethylene plastic compare to glass and fiberglass?
15. What does "mil" mean when expressing the thickness of polyethylene sheeting?
16. Why is black cloth used in the greenhouse?

Answer Key - Teacher Evaluation

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

1. Operator's manual.
2. Longer useful life of equipment.
3. Electric grinder, file, whetstone.
4. More work can be done with less physical exertion and without damage to materials.
5. The paint will stick to the painted surface better.
6. So the equipment can be used again.
7. Test light.
8. By removing a fuse or turning a circuit breaker off.
9. National and local electrical code books.
10. Insulation on the handles.
11. Easier plant care.
12. To increase their usable life.
13. Glazing compound.
14. Polyethylene is much cheaper.
15. The thickness of the plastic in thousandths of an inch.
16. To produce short days for short day plants and induce them to bloom.

Teacher Evaluation

Duty IX: CONSTRUCTING GREENHOUSES AND STRUCTURES FOR ENVIRONMENTAL CONTROL

Complete the statement:

1. A _______________ is the best structure in which to grow plants.

2. The main purpose of a lath house in the summer is to provide _______________.

3. The absence of a _______________ is the major difference between a cold frame and a hot bed.

4. _______________ is probably the best, yet the most expensive, greenhouse covering material.

5. A _______________ _______________ is used as the intermediate step for plants being moved from the greenhouse to the outside.

6. The sand and aggregate material in the bottom of the hot bed is used for _______________.

7. Lath should run _______________ to _______________ whenever possible.

8. _______________ or _______________ are usually used as the construction materials in cold frames and hot beds.

9. A _______________ is used to start seeds and cuttings early in the year.

10. The site for a cold frame is excavated to a depth of at least seven (7) inches to go below the _______________.

Answer Key - Teacher Evaluation

Duty IX: CONSTRUCTING GREENHOUSES AND STRUCTURES FOR ENVIRONMENTAL CONTROL

1. Greenhouse
2. Shade
3. Soil heating cable
4. Glass
5. Cold frame
6. Drainage
7. North, south
8. Treated lumber, concrete blocks
9. Hot bed
10. Frost line

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Teacher Evaluation

Duty X: SELECTING PLANT MATERIALS FOR RETAILING

True or False: Place a "T" or an "F" in the blank at the left of each statement.

_____ 1. A soft head on a carnation means the flower is fresh.

_____ 2. If foliage crumbles when squeezed, the leaves are good for use in arrangements.

_____ 3. Wine-colored poms are suitable for a fall bridesmaid's bouquet.

_____ 4. Decay in a flower starts on the top of the head.

_____ 5. White fleas on a poinsettia plant could be caused by unsanitary greenhouse conditions.

_____ 6. Stem length determines the number of ways in which a flower can be used.

_____ 7. Pittisporum, baker fern, and tiki are good filler materials for arrangements.

Write the answers to the following:

8. What is a "bull"? What does it look like? Would you use it in an arrangement? (Why or why not use it?)

9. Would you select flowers of all the same size for an arrangement? Why or why not?

10. Should eucalyptus be used as line material in a hospital arrangement? Why or why not?

Answer Key - Teacher Evaluation

Duty X: SELECTING PLANT MATERIALS FOR RETAILING

1. F

2. F

3. T

4. F

5. T

6. T

7. T

8. Very tight buds may be "bulls" which are flowers which were cut too soon and will never open fully. They should not be used in arrangements.

9. No. A variety of sizes improves the feeling of movement and delicacy in an arrangement.

10. Eucalyptus should not be used for hospital arrangements. It is known to cause nausea in some people. Most hospitals discourage its use.

Teacher Evaluation

Duty XI: PROLONGING THE USEFULNESS OF PLANT MATERIALS

True or False: Place a "T or an "F" in the blank at the left of each statement.

_____ 1. When conditioning soft-stemmed flowers, all leaves which will be below water level should be removed.

_____ 2. Flowers received from the wholesaler should be placed in a storage cooler immediately.

_____ 3. The stem ends on woody-stemmed flowers should be split or pounded before conditioning.

_____ 4. Frequent misting of tropical plants helps to prolong their life.

_____ 5. Brushing plants with hairy leaves, such as African violets, with a soft brush will damage the plant.

Complete the following statements:

6. Water collection in base of pot indicates poor _______________.

7. Plants whose natural habitat is the desert should be watered _______________.

8. Aphids and mealybugs can be removed from potted plants with a swab soaked in _______________ _______________.

9. White, encrusted soil on surface or pot rim indicates excess _______________ in the soil.

10. Diseased or insect-infested plants should be _______________ to prevent possible spread of disease.

Answer Key - Teacher Evaluation

Duty XI: PROLONGING THE USEFULNESS OF PLANT MATERIALS

1. T
2. F
3. T
4. T
5. F
6. Drainage
7. Sparingly, seldom
8. Rubbing alcohol
9. Salt
10. Isolated, removed

Teacher Evaluation

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

True or False: Place a "T" or an "F" in the blank at the left of each statement.

_____ 1. In a vase arrangement, all parts should blend together to appear as a single group of flowers.

_____ 2. As a general rule, the more flowers used the better the corsage.

_____ 3. A loosely-tied bow is best on body flowers.

_____ 4. A nosegay is a type of hand arrangement.

_____ 5. Net or tulle is cut into triangles to make tufts for corsages.

Complete the following statements:

6. When preparing a bouquet, flower stems should be taped _____________ to prevent unraveling.

7. The bouquet handle should be wrapped in _______________ layers of ribbon.

8. In preparing a basket to receive flowers, a piece of absorbant foam is fitted into the container to _______________ the life of the flowers.

9. When preparing a blanket, all flowers must be _______________ to the _______________ to prevent flowers from falling from the arrangement.

10. Potted plants are decorated with foil and ribbon to increase their _______________.

Answer Key - Teacher Evaluation

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

1. T
2. F
3. F
4. T
5. F
6. Tightly
7. Two (2)
8. Prolong, increase, extend
9. Wired, burlap
10. Salability

Teacher Evaluation

Duty XIII: MERCHANDISING

True or False: Place a "T" or an "F" in the blank at the left of each statement.

_____ 1. Before ordering flowers and plants, it is a good idea to study past sales records to determine the supply needed to meet seasonal demand.

_____ 2. If a florist has an over supply of one type of flower on hand, the price should be raised to increase profits.

_____ 3. Wholesale prices for flowers remain the same year round.

_____ 4. To avoid later problems, a buyer should obtain an exact delivery date when ordering from a wholesaler rather than simply specifying "rush" on the order.

_____ 5. Newspapers set their advertising rates according to the number of people who read their paper.

_____ 6. Since only a small portion of a florist's stock can be advertised, care must be taken in selecting the goods and/or services to be advertised.

_____ 7. Good advertising should impress the reader, even if it exaggerates the value of the item being advertised.

_____ 8. It is illegal in some states to advertise by offering gifts or by conducting a contest which awards prizes.

_____ 9. The amount of money a retail florist spends on advertising does not depend upon the size of the shop or the amount of competition.

_____ 10. In preparing an ad, the copy should be written from the customer's point of view.

_____ 11. People are more encouraged to buy if show or price cards are not used in showroom displays.

_____ 12. Built-up displays are those in which the merchandise is placed on platforms or props to make the articles displayed more attractive.

Answer Key - Teacher Evaluation

Duty XIII: MERCHANDISING

1. T
2. F
3. F
4. T
5. T
6. T
7. F
8. T
9. F
10. T
11. F
12. T

REFERENCE MATERIALS FOR FLORICULTURE CURRICULUM

Part I of this section lists reference materials specified in the learning activities of this curriculum as well as the number of times they are specified. It is recognized, however, that many of the recommended books or audio-visual materials are not currently available in local school programs or libraries. Many of the recommended materials may be available, however, on loan from:

Vocational Curriculum Laboratory
Cedar Lakes Conference Center
Ripley, West Virginia 25271
(304 372-8673)

Part II of this section lists additional reference materials that are currently used in one or more of West Virginia's floriculture programs. It is suggested that the instructor review this list carefully, and, if expedient, make the necessary substitutions in the learning activities in order to utilize materials already on hand.

Part III is a list of other resources which may be useful.

Part I - References Cited in Learning Activities

A.	Texts/Reference Books	Number Citations
1.	Archer, Fred C., Raymond F. Brecker, John C. Frakes, John C. Stewart, and Jeffrey Rig. General Office Practice, 3rd ed. New York: McGraw-Hill, 1968.	3
2.	Bolles, Richard. What Color Is Your Parachute? Penn Speed Press.	1
3.	DeBrum, S. Joseph, Peter G. Haines, Dean R. Malsbary, Anne Scott Daughtrey, General Business for Economic Understanding, 11th ed. South-Western Publishing Company, 1976.	4
4.	Hartmann, Hudson T. and Dale E. Kester. Plant Propagation Principles and Practices, 2nd ed. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1968.	6
5.	Kimbrell, Grady and Ben S. Vineyard. Succeeding in the World of Work. Bloomington, IL: McKnight Publishing Company, 1975.	4
6.	Nelson, Kennard S. Flower and Plant Production in the Greenhouse, 2nd ed. Danville, IL: The Interstate Printers & Publishers, Inc., 1967.	4
7.	Pennsylvania State University. Greenhouse Crop Production, Volume 10, Number 35. University Park, PA: The Pennsylvania State University, Department of Agricultural Education, 1971.	4
8.	Pennsylvania State University, Nursery Production--A Student Handbook, Volume 12, Number 4s. University Park, PA: The Pennsylvania State University, Department of Agricultural Education, 1971.	5
9.	Pennsylvania State University, Retail Flower Shop Operation and Management--A Student Handbook, Volume 9, Number 1s. University Park, PA: The Pennsylvania State University, Department of Agricultural Education, 1968.	12
10.	Potter, Charles H. Greenhouse--Place of Magic. New York, NY: E. P. Dutton and Company, Inc., 1967.	8

		Number Citations
11.	Reiley, H. Edward and Carroll L. Shry, Jr. Introductory Horticulture, Albany, NY: Delmar Publishers, 1979.	18
12.	Richert, Henry G. and others. Retailing Principles and Practices, 6th ed. New York, NY: McGraw-Hill Book Company, Gregg and Community College Division, 1974.	4
13.	Staff of the George J. Ball Company. The Ball Red Book, 13th ed. Chicago, IL: George J. Ball Company, Inc., 1975.	1
14.	U.S. Department of Labor, Employment and Training Administration. Dictionary of Occupational Titles, Fourth Edition. Washington, DC: U.S. Department of Labor, 1977.	2
15.	U.S. Department of Labor, Manpower Administration. Occupational Outlook Handbook, 1978-79 Edition. Washington, D.C.: U. S. Department of Labor, Bureau of Labor Statistics, 1978-79, Bulletin 1955.	1
16.	University of Kentucky and Bureau of Vocational Education, State Department of Education. Retail Flower Shop Salesperson and Floral Designer. Lexington, KY: Bureau of Vocational Education, State Department of Education, n.d.	10
17.	West Virginia Department of Education. Tractor Mechanic Competency-Based Education Curriculum. December 1978.	9
18.	Wingate, John W. and Harland E. Samson. Retail Merchandising, 8th ed. Cincinnati, OH: South-western Publishing Company, 1975.	14

B. Audio-Visual Materials

1.	American Institute of Biological Sciences "How to Safely Use Sprays and Dusts" (filmstrip)	1
2.	Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, NY 11225. "Pruning Practices at Brooklyn Botanic Garden" (film)	1

	Number Citations
3. California State Polytechnic College	
"The Elements of Pruning" (filmstrip)	1
"Fertilizing Ornamental Plants" (filmstrip)	1
"Propagating Ornamental Plants" (filmstrip)	1
4. Singer Career Systems	
"Job Survival Skills Program" (filmstrips/teacher guides/student materials)	7
5. Texas A & M University	
"Soil Structures" (transparencies)	1
6. Vocational Education Products	
"Insect Identification" (slides and identification key)	1

Part II - Reference Materials Currently Used in West Virginia

A. Texts/Reference Books

	Author	Title	Publication Data/Source
1.	Childers, Norman F.	Modern Fruit Science	Interstate
2.	Donahue, Roy L, Hunter Follett & Rodney Tulloch	Our Soils and Their Management	Interstate
3.	Fell, Derek	How to Plant a Vegetable Garden	Interstate
4.	Fell, Derek	New Ideas in Flower Gardening	Interstate
5.	Hemp, Paul	Fifty Laboratory Exercises for Vocational Ornamental Students	Interstate Publishers & Printers
6.	Hemp, Paul	Greenhouse Flowers and Bedding Plants for Agribusiness Studies	Interstate
7.	Janick, Jules	Horticultural Science	Interstate
8.	Mastaberg, John W.	Bedding Plants	Penn State University
9.	McCollum, Ware	Producing Vegetable Crops	Interstate
10.	Moore, Stanley B.	Ornamental Horticulture as a Vocation	Mor-Mac Publishing P.O. Box 984 Fairborn, OH 45324
11.	Nelson, _____	Greenhouse Management	Interstate
12.	Nelson, _____	Watering & Feeding Greenhouse Crops	Texas A & M University
13.	Nelson, _____	Soil and Its Properties	Ohio State
14.	Nelson, _____	Perennials	Ohio State
15.	Nelson, _____	Annuals	Ohio State
16.	Nelson, _____	Flowering Potted Plants	Ohio State

	Author	Title	Publication Data/Source
17.	Nelson, Kennard S.	The Greenhouse Grower	Interstate
18.	Nelson, Laurie K.	Commercial Flower Forcing	McGraw-Hill
19.	Orams, Muriel	Six Ways to Grow Houseplants	Interstate
20.	Texas A & M University	Ornamental Horticulture for Pre-Employment in Vo-Ag (Reference)	Texas A & M University
21.	Vocational Education Products	Exercises in Biological Principles for Agricultural Crops	California State Polytechnic College
22.	Williams, George	Greenhouse Flowers & Bedding Plants for Agribusiness Studies	Interstate
23.	Williams, George S.	Nursery Crops & Landscape Designs	Interstate
24.	Williams, George S.	Weeds of the Southern United States	Cooperative Extension Service University of Georgia College of Agriculture Athens, GA

B. Audio-Visual Materials/Other Materials

1.	American Institute of Biological Sciences	How to Recognize and Control Common Greenhouse Pests (filmstrip, slides, and cassettes)	Prentice Hall Media
2.	Texas A & M University	Greenhouse Management and Operation (transparencies, course outlines and lesson plans)	Texas A & M University
3.	Virginia Division of Vocational Education	Preparing EMR Students for Vocational Horticulture (lesson plans)	Curriculum Center Cedar Lakes

	Author	Title	Publication Data/Source
4.	Vocational Education Products	Controlling Pests of Ornamental Plants (filmstrips and cassettes)	California State Polytechnic College
5.	Vocational Education Products	The Elements of Pruning (filmstrips and cassettes)	California State Polytechnic College
6.	Vocational Education Products	Fertilizing Ornamental Plants (filmstrips and cassettes)	California State Polytechnic College
7.	Vocational Education Products	Growing Media for Ornamental Plants (filmstrips and cassettes)	California State Polytechnic College
8.	Vocational Education Products	Lawns and Ground Covers (filmstrips and cassettes)	California State Polytechnic College
9.	Vocational Education Products	Propagating Ornamental Plants (filmstrips and cassettes)	California State Polytechnic College

Part III - Other Resources

A. Texts/Reference Books

1. Carrick, James. *Planting, Growing, Caring*. New Brunswick, NJ: State of New Jersey, Department of Education, Division of Vocational Education and Career Preparation, 1979.

2. Dallas Independent School District. *Floral Design--Student Learning and Teacher Implementation Plan*. New York, NY: Harper and Row Publishers, Inc., 1976.

3. Facilitator Project of New Jersey in conjunction with the Division of Vocational Education, Right to Read Program. *Retail Floral Sales, Glossary of Key Words*. New Brunswick, NJ: New Jersey Vocational-Technical Curriculum Laboratory, Rutgers - The State University, n.d.

4. Pennsylvania State University, *Nursery Production--A Teacher's Manual*, Volume 12, Number 4t. University Park, PA: The Pennsylvania State University, Department of Agricultural Education, 1971.

5. Pennsylvania State University. *Retail Flower Shop Operation and Management*--A Teacher's Guide, Volume 9, Number 1t. University Park, PA: The Pennsylvania State University, Department of Agricultural Education, 1968.

6. Wilson, Aubrey and Edward Ososky. *Course of Study--Horticulture II*. Pittsburgh, PA: Division of Curriculum and Instruction, Board of Public Education, 1968.

EQUIPMENT AND SUPPLIES

This section includes two lists of equipment and supplies specified in this curriculum.

The first list--Field and/or Greenhouse Equipment and Supplies--shows basic supplies and equipment required to equip the instructional laboratory of a floriculture program for units concerned with growing flowers in the field and greenhouse.

The second list--Floral Arranger/Floral Shop Operation Equipment and Supplies--lists basic items needed for curriculum units dealing with arranging and selling floral products.

Additional items to be considered for the floriculture program are shown in Appendix A-5 and Appendix B-1 (those items derived from the survey of incumbent workers).

FLORICULTURE

FIELD AND/OR GREENHOUSE EQUIPMENT AND SUPPLIES

Cultivating Equipment/Supplies

Applicator, fertilizer
Applicator, oil
Applicator, steam
Auger, soil

Bed press
Bedwire
Benches
Blocks, concrete
Braces, bench
Brushes, paint
Brushes, wire
Buckets
Bulbs, light

Cables, soil heating
Cans, watering
Carrier, fertilizer
Cartons, cardboard
Cement
Chisels
Cleaner, welding tip
Clocks, time
Cloth, black
Clothespins
Clothes, wipe
Code books, electrical
Cold-storage unit, with thermostat
Compound, glazing
Compound, piping
Compound, shading
Crates, wooden
Cultivator, or tiller
Cutter, glass

Detergent
Driver, post

Excavating equipment

Fasteners, assorted nails,
  screws, etc.
Files
Fuel, diesel
Fuses

Gaskets
Gauges, pressure
Glasses, safety
Grinder, electric
Gun, dusting

Hammers, assorted
Harrow, disc
Heads, mist
Heads, sprinkler
Heaters, field
Heating, mist, propagation
Heating system,
  thermostat controlled
Hoes, garden
Hose, air
Hose, water
Humidifier

Knife, pocket
Knife, putty

Ladders
Light, test
Lumber, assorted sizes

Mallets
Marking pens
Masonry tools
Meter, light
Mist propagation system
Mixer, mechanical

Oil, lubricating

Paint
Pig rings, grommets
Planter, bulb
Plane
Pliers
Poison, rat
Posts
Preservative, wood

FIELD AND/OR GREENHOUSE EQUIPMENT AND SUPPLIES

Cultivating Equipment/Supplies (continued)

Rakes, garden
Regulators, pressure
Rope, twine

Sandpaper
Saran or plastic
Saw, band
Saws, hand
Scissors
Screening
Screwdrivers, assorted
Shadecloth
Shadehouse
Shears, floral
Shears, pruning
Shields, face
Shovels
Shreader, soil
Sieves, flour
Sockets, clamp-on
Spades
Sprayer, paint
Spreader
Stakes
Stapler
Staples
String

Tape
Tape, steel (measuring)
Tarpaulin
Thermometer, maximum-minimum
Thermometer, probe
Thermostat
Thinner, paint
Timing system control center
Tractor with 3-prong hookup
Trowel
Turpentine

Watch
Wheelbarrow
Wire
Wire cutters
Wire, insulated electrical
Wires, support
Wool, steel

Valves
Vise

Wheel, emery
Whetstone
Workbench
Wrenches, assorted

FIELD AND/OR GREENHOUSE EQUIPMENT AND SUPPLIES (continued)

Testing Equipment/Supplies

Bags, plastic
Beakers, 250 ml
Bottles, clear glass

Chart, soluble salts content
Containers (clean) for soil collection

Dye, test
Detergent

Glass, magnifying

Labels

Map, county soil survey
Meter, pH, electric

Solu-bridge, or equivalent instrument
Sterilization unit

Tubes, soil sampling

Water, distilled

Planting, Growing Supplies

Aggregate, coarse

Bark, pine
Bands, rubber
Bulbs

Clay

Fertilizer, granular and liquid
Fungicidal dip

Growing medium

Lime

Moss, peat

Perlite
Pots, plant
Preservative, floral

Rooting aids

Sand
Seedlings
Seeds
Shavings, cypress

Vermiculite

FLORAL ARRANGER/FLORAL SHOP OPERATION EQUIPMENT AND SUPPLIES

Accessories, floral
Ads (sample)
Alcohol

Bands, rubber
Bands, wrist
Burlap

Calculator
Cards, enclosure
Cards, show/price
Cartons, cardboard
Care books, plant and flower
Catalogs, seed and flower
Chart, sales tax
Checks, sales
Cooler
Cutters, wire

Directory, florists' wire service
Disinfectants
Dividers (flower racks)

Easel
Excelsior

Flashlight
Foil
Forms, wire wreath

Invoices, blank
Invoices, sample

Knives, assorted

Labels, shipping

Maps, local area

Handles, bouquet
Holder, spray
Humidifier

Imprinter, credit card
Invoices, blank
Invoices, sample

Paper, tissue
Paper, waxed (green)
Paper, wrapping
Pen, lettering/marking
Picks, water
Picks, wooden
Pins, greening
Preservative, floral
Props, display

Register, cash and tape
Ribbon
Route sheets (delivery)

Scissors
Shears, pruning
Sponges
Sprayer, water
Sprays, insecticide
Stapler
Staples
Stems, chenille
Styrofoam
Swabs, cotton

Tags, delivery
Tape, floral
Tapes (radio/TV scripts)
Tickets, charge
Tickets, sample charge
Toothbrushes
Tulle
Tweezers

Vases and containers, assorted

Wire, floral

- - - - -

Artificial flowers
Cut flowers
Cut foliage
Decorative seeds, pods, etc.
Dried flowers
Evergreens
Potted plants

APPENDIX A

RESPONSES TO VALIDATION SURVEY

APPENDIX A-1

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS
1978

Background Data	All Respondents (N=52)
	%
1. Sex	
Male	83
Female	17
2. Time Spent on Present Job	
1-5 Years	44
6-10 Years	16
11-20 Years	17
21-46 Years	23
3. Years Spent in Career Field	
1-5 Years	25
6-10 Years	19
11-15 Years	10
16-20 Years	17
21-30 Years	12
31 Years or Over	17
4. Present Position by Job Title	
1. President/Vice President	16
2. Owner	33
3. Teacher/Instructor/Professor	23
4. Superintendent/Supervisor	0
5. Designer	6
6. Manager	18
7. Florist	0
8. Flower Grower	4

APPENDIX A-2

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY LOCATION - 1978

1 = Never
2 = Seldom
3 = Sometimes
4 = Often

Tasks	West Virginia N = 20				Pennsylvania N = 32			
	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%
A. PREPARATION OF SOILS AND PLANTING MEDIA								
1. Take soil samples	30	20	30	20	28	25	28	16
2. Analyze soil samples to determine pH levels	50	10	20	20	47	25	16	12
3. Analyze soil samples to determine soluble salt content	60	15	15	10	53	19	19	9
4. Shred planting media	50	10	25	15	41	12	22	22
5. Screen planting media	60	10	25	5	56	9	12	19
6. Mix media materials	30	10	15	45	34	9	12	41
7. Pasteurize prepared media with steam	55	5	20	20	53	16	9	19
8. Pasteurize media with chemicals	85	15	0	0	69	16	15	0
9. Sterilize (pasteurize) soils	40	15	20	25	56	9	16	16
10. Mix fertilizers into media	30	10	35	25	28	19	19	31
11. Construct open drainage ditches	75	20	5	0	87	12	0	0
12. Apply lime and/or fertilizer	30	5	35	30	28	9	22	37
13. Till land	55	10	20	15	56	15	12	16
14. Disk land	65	15	15	5	72	16	9	3
15. Level or smooth fields	70	15	10	5	75	12	9	3
16. Mark off location of beds	65	30	5	0	59	12	19	9
17. Shape or form beds	45	35	15	5	66	12	16	6
18. Mark off planting spaces with bedwire	45	35	0	20	66	12	12	6
B. PROPAGATION AND PLANTING OF PLANTS								
1. Regulate temperature of cold storage unit	55	20	5	20	50	19	19	9
2. Plant seeds	25	5	20	50	28	6	22	41
3. Plant bulbs	25	10	50	15	34	6	34	22
4. Transplant seedlings or cuttings	15	5	20	60	25	6	25	41
5. Set time clocks for automatic mist propagation system	60	10	5	25	56	19	9	12
6. Take cuttings	20	10	10	60	28	9	12	47
7. Stick cuttings	25	10	5	60	34	6	16	44
8. Remove rooted cuttings	25	5	15	55	31	9	12	44
9. Package cuttings for shipment	80	15	0	5	97	0	3	0
10. Label plants or cuttings	35	10	20	35	47	6	19	25

APPENDIX A-2

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY LOCATION - 1978 (Continued)

Tasks	West Virginia N = 20				Pennsylvania N = 32			
	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%
C. CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES								
1. Pinch flowering plants	25	5	15	55	31	3	22	41
2. Disbud flowering plants	25	5	20	50	37	6	25	28
3. Prune plants	35	10	20	35	41	6	25	25
4. Apply growth regulating chemicals	40	15	15	30	44	9	16	25
5. Force bulbs (control temperature, moisture and light)	45	10	25	20	41	19	25	12
6. Install shade cloth	40	20	15	25	40	9	31	16
7. Apply shading compound or paint to greenhouse glass	45	15	20	20	34	16	31	16
8. Install black cloth to regulate photoperiod	50	10	15	25	44	9	22	22
9. Provide the required light intensity for photoperiod control	60	5	10	25	53	9	16	19
10. Regulate time clocks	45	20	15	20	56	9	9	22
11. Adjust or control temperature (air conditioning, vents or fans)	30	5	20	45	41	6	12	37
12. Check and turn on field heaters	85	5	5	5	94	6	0	0
13. Cultivate soils (rototill soils)	60	15	20	5	53	9	19	16
14. Aerate compacted soils in beds	65	10	20	5	81	9	9	0
15. Stake and tie plants	40	10	30	20	44	6	34	12
16. Raise or elevate bedwire	55	15	15	15	69	6	16	6
17. Repair broken pipes, sprinkler heads, mist heads and/or valves	40	35	15	10	41	12	22	22
18. Apply granular fertilizer	50	15	20	15	44	6	40	6
19. Apply liquid fertilizer	25	5	15	55	31	3	9	50
20. Locate and report any malfunctions of fertilizer injection system	50	25	15	10	59	9	12	16
D. IRRIGATION PRACTICES								
1. Set time control valves (clocks)	70	20	0	10	62	9	12	12
2. Hand irrigate plants (hand watering)	35	10	0	55	40	6	12	37

REVALIDATION SURVEY OF INCUMBENT WORKERS BY LOCATION - 1978 (Continued)

Tasks	West Virginia N = 20				Pennsylvania N = 32			
	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%
3. Apply water in ditches or furrows (furrow irrigation)	90	10	0	0	97	0	0	3
4. Regulate overhead irrigation system (time clocks)	75	15	5	5	84	0	6	9
5. Regulate trickle irrigation system (ooze system)	80	10	0	10	78	0	6	12
6. Pump water for irrigation	90	5	0	5	100	0	0	0
7. Make minor electrical repairs and replace seals on irrigation supply pump	70	15	10	5	69	9	12	9
PLANT PEST AND DISEASE CONTROL								
1. Report disease and insect damage	40	5	20	35	28	3	16	47
2. Mix chemicals	40	5	5	50	28	3	22	44
3. Apply chemicals	30	5	10	55	25	6	22	41
4. Remove diseased plants	20	5	35	40	31	6	22	37
5. Remove weeds manually from potted plants	30	10	30	30	28	16	16	37
6. Remove weeds manually from floral crops	40	10	25	25	56	9	9	25
7. Remove weeds with tractor drawn mechanical cultivators	80	15	5	0	87	0	3	9
8. Set out poisoned bait to eradicate rodents	55	40	5	0	69	16	6	9
9. Identify and report spray damage	55	25	15	5	44	12	25	16
10. Clean spray equipment after use (nozzle, tanks, hoses, etc.)	30	5	25	40	31	6	12	44
11. Repair lines and nozzles on spray equipment	55	20	10	15	53	9	16	19
F. HARVESTING CROPS								
1. Cut flowers	40	5	15	40	47	12	12	25
2. Count and bunch flowers	50	15	5	30	53	0	25	18
3. Prepare and place cut flowers in water or preservative	40	5	15	40	37	9	16	34
4. Load potted plants for hauling	45	5	10	40	50	9	12	25
5. Remove salable plants from beds or benches	35	5	20	40	41	6	12	37
6. Dig bulbs or corms	70	20	0	10	75	9	9	3
7. Clean and size harvested bulbs	90	10	0	0	87	3	6	3
8. Dry harvested bulbs or corms	85	10	5	0	84	3	6	6

APPENDIX A-2

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY LOCATION - 1978 (Continued)

Tasks	West Virginia N = 20				Pennsylvania N = 32			
	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%
9. Treat bulbs or corms to control fungi or other disease organisms	80	15	5	0	84	3	3	9
10. Remove bedwire from harvested areas	70	25	5	0	66	12	9	9
11. Sanitize production area	50	10	20	20	37	9	22	28
G. PACKAGING, STORAGE AND SHIPMENT								
1. Grade potted flowers or foliage plants	45	10	10	35	59	3	9	25
2. Grade cut flowers	60	10	0	30	62	6	12	16
3. Remove dead and diseased plant parts	30	10	25	35	31	12	6	47
4. Place plants (floral and foliage) in storage	45	5	5	45	53	6	16	22
5. Prepare invoices and shipping labels	50	10	10	30	53	6	9	28
6. Package orders for shipment	55	10	5	30	50	3	16	28
7. Assemble shipping cartons	70	15	0	15	69	3	6	19
8. Inventory plants	55	5	15	25	47	12	15	22
H. MISCELLANEOUS MAINTENANCE AND REPAIRS								
1. Grease equipment	40	10	20	25	44	16	16	22
2. Oil electric motors	45	10	20	20	44	16	25	12
3. Sharpen hand tools	30	10	35	20	41	12	28	16
4. Repair wooden greenhouse benches	60	5	25	10	53	12	28	3
5. Prepare and paint equipment	45	10	25	20	44	25	25	3
6. Paint greenhouse frames, and other structures	45	20	15	20	44	22	28	3
7. Replace and glaze broken greenhouse lights	35	10	25	25	41	9	28	19
8. Replace plastic covering on greenhouse structures	50	10	20	15	69	9	12	6
9. Repair wooden portions of the greenhouse superstructure	55	10	20	10	62	19	12	3
10. Replace damaged sections of saran	75	5	10	10	84	6	3	6
11. Replace damaged support wires for saran or black cloth	70	15	5	10	65	12	16	3
12. Replace valves on irrigation system	70	15	0	10	72	19	6	3
13. Replace gaskets on irrigation system	70	10	5	10	78	9	6	6

APPENDIX A-2

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY LOCATION - 1978 (Continued)

Tasks	West Virginia N = 20				Pennsylvania N = 32			
	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%
I. CONSTRUCTING ENVIRONMENTAL CONTROL STRUCTURES								
1. Construct greenhouse	60	25	15	0	78	19	0	3
2. Construct cold frame	55	30	10	5	84	12	0	3
3. Construct hot bed	65	10	20	5	97	3	0	0
4. Construct lath house	85	15	0	0	87	6	6	0
J. RETAILING PLANT AND FLOWERS								
1. Select cut flowers	35	5	20	40	44	0	9	44
2. Select cut foliage	35	20	20	25	44	3	9	44
3. Select flowering plants	20	5	35	40	25	3	22	47
4. Select foliage plants	25	5	30	40	28	0	19	50
5. Condition cut flowers and foliage	35	5	15	45	37	0	12	47
6. Store cut flowers	30	10	15	45	40	0	16	41
7. Inspect potted plants for pests and damage	30	15	10	45	25	9	16	47
8. Water potted plants	10	0	10	80	16	9	16	56
9. Design arrangements for the home	25	0	5	70	28	6	9	53
10. Design arrangements for weddings	25	5	0	70	34	6	12	44
11. Design arrangements for funerals	25	10	0	65	34	6	12	44
12. Design body flowers (corsages, etc.) for special events	25	0	15	60	31	6	19	41
K. MERCHANDISING PLANT MATERIALS								
1. Establish prices	25	0	20	55	9	3	16	66
2. Select advertising media	50	5	5	40	31	16	22	25
3. Prepare advertising copy and layout	50	5	15	30	44	9	19	22
4. Arrange display of stock in showroom	20	5	10	65	31	3	28	31
5. Design and locate special indoor displays	35	5	15	45	37	9	22	25
6. Design and locate special outdoor displays	60	10	10	20	62	6	12	16
7. Provide information to customer or recipient	10	0	10	80	9	6	25	53
8. Register sale of merchandise	20	5	5	70	25	6	12	50
9. Place or receive orders through wire service	30	0	5	65	53	6	6	31

APPENDIX A-3

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY TOTAL TIME IN CAREER FIELD - 1978

1 = Never
2 = Seldom
3 - Sometimes
4 = Often

Tasks	1 - 5 Years N = 6				6 - 10 Years N = 10				Over 10 Years N = 29			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
A. PREPARATION OF SOILS AND PLANTING MEDIA												
1. Take soil samples	67	0	33	0	10	40	30	20	28	28	28	14
2. Analyze soil samples to determine pH levels	67	0	33	0	30	30	20	20	48	24	14	14
3. Analyze soil samples to determine soluble salt content	67	0	33	0	30	30	20	20	58	21	14	7
4. Shred planting media	83	0	17	0	30	30	0	40	34	7	34	21
5. Screen planting media	83	0	0	17	40	30	0	30	52	7	28	10
6. Mix media materials	83	0	0	17	10	20	0	70	28	10	21	41
7. Pasteurize prepared media with steam	83	0	17	0	40	30	0	30	55	10	14	17
8. Pasteurize media with chemicals	100	-	-	-	60	30	10	-	72	14	14	-
9. Sterilize (pasteurize) soils	83	0	17	0	40	30	10	20	45	10	24	17
10. Mix fertilizers into media	67	0	33	0	20	20	10	50	24	10	34	27
11. Construct open drainage ditches	100	0	-	-	70	30	-	-	86	14	-	-
12. Apply lime and/or fertilizer	67	0	17	16	0	30	10	60	28	3	38	28
13. Till land	83	0	0	17	50	40	10	0	48	10	24	17
14. Disk land	83	0	17	0	50	50	-	-	72	10	14	3
15. Level or smooth fields	83	0	17	0	60	30	10	0	76	10	10	3
16. Mark off location of beds	83	0	0	17	50	40	10	0	58	14	21	7
17. Shape or form beds	67	17	0	16	40	40	20	0	62	17	17	3
18. Mark off planting spaces with bedwire	83	17	0	0	40	40	0	20	59	10	14	14
B. PROPAGATION AND PLANTING OF PLANTS												
1. Regulate temperature of cold storage unit	100	-	-	-	20	50	20	10	58	14	10	14
2. Plant seeds	50	16	17	17	10	10	30	50	27	3	14	52

APPENDIX A-3

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY TOTAL TIME IN CAREER FIELD - 1978
(Continued)

Tasks	1 - 5 Years N = 6				6 - 10 Years N = 10				Over 10 Years N = 29			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
3. Plant bulbs	67	0	33	0	10	10	60	20	34	7	31	24
4. Transplant seedlings or cuttings	33	16	50	0	10	10	20	60	24	3	14	55
5. Set time clocks for automatic mist propagation system	83	17	0	0	40	20	20	20	55	14	7	21
6. Take cuttings	50	0	50	0	10	10	20	60	28	10	3	55
7. Stick cuttings	67	0	33	0	10	10	20	60	31	10	3	55
8. Remove rooted cuttings	67	0	33	0	10	10	20	60	28	7	10	52
9. Package cuttings for shipment	100	0	0	0	70	20	10	0	97	3	0	0
10. Label plants or cuttings	67	0	33	0	30	20	20	30	38	7	17	34
C. CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES												
1. Pinch flowering plants	67	0	33	0	20	20	30	30	24	0	14	59
2. Disbud flowering plants	67	16	17	0	20	20	30	30	31	0	21	45
3. Prune plants	67	0	16	17	30	20	30	20	34	7	24	31
4. Apply growth regulating chemicals	67	0	17	0	40	20	20	20	34	14	14	34
5. Force bulbs (control temperature, moisture and light)	83	17	0	0	30	20	40	10	38	14	28	17
6. Install shade cloth	67	0	33	0	50	20	20	10	34	10	28	24
7. Apply shading compound or paint to greenhouse glass	67	17	16	0	40	10	40	10	34	21	21	21
8. Install black cloth to regulate photoperiod	83	17	0	0	40	20	0	40	45	3	31	17
9. Provide the required light intensity for photoperiod control	100	0	0	0	40	20	0	40	52	7	24	14
10. Regulate time clocks	100	0	0	0	50	20	10	20	45	14	17	21
11. Adjust or control temperature (air conditioning, vents or fans)	50	17	33	0	30	10	10	50	38	3	14	41
12. Check and turn on field heaters	100	0	0	0	80	10	0	10	93	3	3	0
13. Cultivate soils (rototill soils)	83	0	0	17	60	20	20	0	48	14	21	14
14. Aerate compacted soils in beds	83	17	0	0	70	10	20	0	76	7	14	3
15. Stake and tie plants	67	0	33	0	50	20	20	10	38	3	34	21

APPENDIX A-3

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY TOTAL TIME IN CAREER FIELD - 1978
(Continued)

Tasks	1 - 5 Years N = 6				6 - 10 Years N = 10				Over 10 Years N = 29			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
16. Raise or elevate bedwire	83	17	0	0	80	10	0	10	51	7	28	10
17. Repair broken pipes, sprinkler heads, mist heads and/or valves	67	0	17	16	40	10	40	10	38	28	14	17
18. Apply granular fertilizer	83	0	17	0	50	20	20	10	38	10	38	10
19. Apply liquid fertilizer	50	0	33	0	30	10	10	50	21	3	10	62
20. Locate and report any malfunctions of fertilizer injection system	100	0	0	0	40	20	20	20	55	20	10	10
D. IRRIGATION PRACTICES												
1. Set time control valves (clocks)	83	17	0	0	40	20	20	20	72	14	3	7
2. Hand irrigate plants (hand watering)	83	0	17	0	20	10	0	70	38	7	7	45
3. Apply water in ditches or furrows (furrow irrigation)	100	-	-	-	80	20	-	-	100	-	-	-
4. Regulate overhead irrigation system (time clocks)	100	-	-	-	70	10	10	10	83	7	7	3
5. Regulate trickle irrigation system (ooze system)	100	-	-	-	60	10	10	20	79	3	3	10
6. Pump water for irrigation	100	-	-	-	80	10	10	-	100	-	-	-
7. Make minor electrical repairs and replace seals on irrigation supply pump	83	0	17	0	40	20	20	80	83	7	7	3
E. PLANT PEST AND DISEASE CONTROL												
1. Report disease and insect damage	83	17	0	0	10	10	30	50	31	0	17	48
2. Mix chemicals	67	0	16	17	10	20	20	50	38	0	14	45
3. Apply chemicals	67	0	16	17	0	30	20	50	31	0	17	48
4. Remove diseased plants	67	0	16	17	0	20	30	50	24	3	31	38
5. Remove weeds manually from potted plants	67	17	0	16	0	10	40	50	34	10	24	28
6. Remove weeds manually from floral crops	83	0	0	17	50	10	20	20	45	10	21	24

APPENDIX A-3

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY TOTAL TIME IN CAREER FIELD - 1978
(Continued)

Tasks	1 - 5 Years N = 6				6 - 10 Years N = 10				Over 10 Years N = 29			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
7. Remove weeds with tractor drawn mechanical cultivators	83	0	17	0	70	20	0	10	90	3	0	7
8. Set out poisoned bait to eradicate rodents	83	17	0	0	70	20	10	0	52	31	7	10
9. Identify and report spray damage	83	17	0	0	40	30	30	0	52	10	21	14
10. Clean spray equipment after use (nozzle, tanks, hoses, etc.)	67	0	17	16	10	10	20	60	34	7	17	38
11. Repair lines and nozzles on spray equipment	83	17	0	0	40	20	20	20	52	14	14	17
F. HARVESTING CROPS												
1. Cut flowers	83	0	0	17	40	20	20	20	34	10	17	34
2. Count and bunch flowers	83	0	17	0	60	10	20	10	41	3	17	34
3. Prepare and place cut flowers in water or preservative	67	16	0	17	40	20	20	20	28	3	14	52
4. Load potted plants for hauling	83	17	0	0	40	20	10	30	41	3	17	35
5. Remove salable plants from beds or benches	67	17	0	16	30	10	20	40	31	3	21	41
6. Dig bulbs or corms	83	17	0	0	70	20	10	0	69	10	7	10
7. Clean and size harvested bulbs	83	17	0	0	70	20	10	0	93	0	3	0
8. Dry harvested bulbs or corms	83	17	0	0	70	20	10	0	93	0	3	3
9. Treat bulbs or corms to control fungi or other disease organisms	83	17	0	0	70	20	0	10	90	3	3	3
10. Remove bedwire from harvested areas	83	17	0	0	70	20	0	10	65	17	14	0
11. Sanitize production area	50	17	16	17	40	20	20	20	38	7	28	24
G. PACKAGING, STORAGE AND SHIPMENT												
1. Grade potted flowers or foliage plants	67	17	0	16	50	10	10	30	52	3	10	31
2. Grade cut flowers	83	17	0	0	60	10	20	10	59	7	3	31

APPENDIX A-3

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY TOTAL TIME IN CAREER FIELD - 1978
(Continued)

Tasks	1 - 5 Years N = 6				6 - 10 Years N = 10				Over 10 Years N = 29			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
3. Remove dead and diseased plant parts	50	33	0	17	30	10	20	40	28	10	17	41
4. Place plants (floral and foliage) in storage	83	17	0	0	50	10	20	20	41	3	14	38
5. Prepare invoices and shipping levels	83	0	17	0	30	40	20	10	48	0	7	41
6. Package orders for shipment	83	0	17	0	40	30	20	10	45	0	10	41
7. Assemble shipping cartons	100	0	0	0	50	30	10	10	69	3	3	21
8. Inventory plants	50	17	16	17	50	20	0	30	48	7	21	21
H. MISCELLANEOUS MAINTENANCE AND REPAIRS												
1. Grease equipment	67	16	17	0	30	20	20	30	41	14	14	24
2. Oil electric motors	67	33	0	0	30	20	20	30	45	[illegible]	28	14
3. Sharpen hand tools	67	0	33	0	10	30	30	30	31	[illegible]	38	14
4. Repair wooden greenhouse benches	67	17	16	0	50	10	30	10	59	10	28	0
5. Prepare and paint equipment	67	16	17	0	40	10	40	10	41	21	24	10
6. Paint greenhouse frames, and other structures	67	33	0	0	40	20	30	10	41	17	28	10
7. Replace and glaze broken greenhouse lights	50	17	33	0	30	10	20	40	41	10	28	14
8. Replace plastic covering on greenhouse structures	83	17	0	0	60	10	10	20	51	10	24	7
9. Repair wooden portions of the greenhouse superstructure	83	17	0	0	50	10	30	10	55	21	14	3
10. Replace damaged sections of saran	83	17	0	0	70	10	0	20	82	3	10	3
11. Replace damaged support wires for saran or black cloth	67	33	0	0	70	10	10	10	72	10	10	3
12. Replace valves on irrigation system	83	17	0	0	60	20	10	10	72	20	0	3
13. Replace gaskets on irrigation system	83	17	0	0	70	10	10	10	79	10	0	7

APPENDIX A-3

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY TOTAL TIME IN CAREER FIELD - 1978
(Continued)

Tasks	1 - 5 Years N = 6				6 - 10 Years N = 10				Over 10 Years N = 29			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
I. CONSTRUCTING ENVIRONMENTAL CONTROL STRUCTURES												
1. Construct greenhouse	100	0	0	0	50	40	10	0	69	24	3	3
2. Construct cold frame	67	17	16	0	50	40	0	10	76	17	3	3
3. Construct hot bed	67	17	17	0	70	10	10	10	90	3	7	0
4. Construct lath house	83	0	17	0	70	30	0	0	90	7	3	0
J. RETAILING PLANT AND FLOWERS												
1. Select cut flowers	17	0	33	50	60	10	0	30	31	0	14	52
2. Select cut foliage	17	0	33	50	60	20	0	20	34	7	14	45
3. Select flowering plants	33	0	33	33	30	10	20	40	14	0	31	52
4. Select foliage plants	33	0	33	33	30	10	20	40	17	0	28	52
5. Condition cut flowers and foliage	33	0	33	33	50	10	0	40	24	0	14	59
6. Store cut flowers	33	0	33	33	60	10	0	30	24	0	17	55
7. Inspect potted plants for pests and damage	33	0	50	17	30	10	10	50	17	17	10	52
8. Water potted plants	17	0	0	83	10	0	20	70	7	7	14	70
9. Design arrangements for the home	0	0	0	100	40	0	10	50	21	7	3	66
10. Design arrangements for weddings	0	0	0	100	40	10	0	50	28	7	10	52
11. Design arrangements for funerals	17	0	0	83	40	0	10	50	31	7	3	55
12. Design body flowers (corsages, etc.) for special events	0	0	17	83	40	0	0	60	24	7	24	41
K. MERCHANDISING PLANT MATERIALS												
1. Establish prices	0	0	17	83	0	0	20	80	10	3	21	59
2. Select advertising media	0	50	0	50	40	0	20	40	38	7	17	31
3. Prepare advertising copy and layout	17	0	50	33	40	10	20	30	45	7	14	28

APPENDIX A-3

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY TOTAL TIME IN CAREER FIELD - 1978
(Continued)

Tasks	1 - 5 Years N = 6				6 - 10 Years N = 10				Over 10 Years N = 29			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
4. Arrange display of stock in showroom	0	17	33	50	30	0	20	50	17	3	24	48
5. Design and locate special indoor displays	0	17	50	33	30	0	20	50	34	10	17	31
6. Design and locate special outdoor displays	33	17	33	17	60	10	0	30	62	7	10	17
7. Provide information to customer or recipient	0	17	0	83	10	0	30	60	0	3	24	66
8. Register sale of merchandise	17	-	16	67	10	10	20	60	14	7	7	66
9. Place or receive orders through wire service	33	-	-	67	40	10	10	40	41	3	7	45

APPENDIX A-4

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY PRESENT POSITION - 1978

1 = Never
2 = Seldom
3 = Sometimes
4 = Often

Tasks	Growers N = 27				Florists N = 12				Instructors N = 12			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
A. PREPARATION OF SOILS AND PLANTING MEDIA												
1. Take soil samples	33	11	30	22	42	41	17	0	8	33	33	25
2. Analyze soil samples to determine pH levels	48	15	19	18	58	33	8	0	33	17	25	25
3. Analyze soil samples to determine soluble salt content	59	15	19	7	58	33	8	0	42	8	25	25
4. Shred planting media	52	7	22	15	42	33	8	17	25	0	42	33
5. Screen planting media	63	7	19	7	58	25	8	8	42	0	25	33
6. Mix media materials	44	7	11	33	42	25	8	25	0	0	25	75
7. Pasteurize prepared media with steam	63	4	15	15	42	25	8	25	42	17	16	25
8. Pasteurize prepared media with chemicals	82	7	11	0	67	33	0	0	75	8	17	0
9. Sterilize (pasteurize) soils	56	11	11	19	33	25	17	25	50	0	33	17
10. Mix fertilizers into media	30	11	26	30	50	25	8	17	8	8	42	42
11. Construct open drainage ditches	81	15	4	0	75	25	0	0	92	8	0	0
12. Apply lime and/or fertilizer	33	0	30	33	42	33	8	17	8	0	42	50
13. Till land	56	7	22	15	58	25	8	8	50	17	8	25
14. Disk land	67	11	15	7	67	25	8	0	75	17	8	0
15. Level or smooth fields	78	7	11	4	67	25	8	0	67	17	8	8
16. Mark off location of beds	67	19	7	7	67	25	8	0	42	17	33	8
17. Shape or form beds	67	15	14	4	67	33	0	0	33	17	33	17
18. Mark off planting spaces with bedwire	59	19	15	4	67	25	0	8	50	17	0	33

APPENDIX A-4

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY PRESENT POSITION - 1978
(Continued)

Tasks	Growers N = 27				Florists N = 12				Instructors N = 12			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
B. PROPAGATION AND PLANTING OF PLANTS												
1. Regulate temperature of cold storage unit	56	11	15	15	42	42	8	8	59	16	18	8
2. Plant seeds	33	4	26	33	42	17	25	16	0	0	8	92
3. Plant bulbs	37	7	37	15	50	8	33	8	0	8	50	42
4. Transplant seedlings or cuttings	26	8	22	44	33	17	33	17	0	0	17	83
5. Set time clocks for automatic mist propagation system	70	7	8	15	58	25	8	8	33	17	17	33
6. Take cuttings	26	11	7	52	50	8	8	33	0	8	25	67
7. Stick cuttings	37	7	4	52	50	8	17	25	0	8	25	67
8. Remove rooted cuttings	33	7	7	48	50	17	8	25	0	0	33	67
9. Package cuttings for shipment	92	4	0	4	83	17	0	0	92	0	8	0
10. Label plants or cuttings	44	11	15	26	67	8	8	17	16	0	42	42
C. CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES												
1. Pinch flowering plants	37	0	19	41	42	17	8	33	0	0	33	67
2. Disbud flowering plants	41	0	22	33	42	17	16	25	8	8	33	50
3. Prune plants	41	4	22	30	58	8	17	17	17	17	33	33
4. Apply growth regulating chemicals	52	7	4	33	58	25	0	17	8	8	50	25
5. Force bulbs (control temperature, moisture and light)	52	4	26	15	50	17	17	16	17	33	33	17
6. Install shade cloth	48	7	22	19	50	25	0	25	17	17	50	16
7. Apply shading compound or paint	48	11	19	19	42	17	33	8	17	25	33	25
8. Install black cloth to regulate photoperiod	59	7	11	19	50	17	17	16	17	8	42	33
9. Provide the required light intensity for photoperiod control	67	4	11	15	58	17	8	17	33	8	25	33
10. Regulate time clocks	63	7	7	19	58	25	8	8	25	17	25	33

APPENDIX A-4

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY PRESENT POSITION - 1978
(Continued)

Tasks	Growers N = 27				Florists N = 12				Instructors N = 12			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
11. Adjust or control temperature (air conditioning, vents or fans)	52	0	15	30	42	8	17	33	0	17	17	66
12. Check and turn on field heaters	93	7	0	0	83	8	8	0	92	0	0	8
13. Cultivate soils (rototill soils)	56	11	22	7	75	8	0	17	33	17	33	17
14. Aerate compacted soils in beds	78	7	15	0	83	8	0	8	67	8	25	0
15. Stake and tie plants	48	4	33	11	50	17	17	16	25	0	50	25
16. Raise or elevate bedwire	67	7	19	4	58	8	8	25	58	17	17	8
17. Repair broken pipes, sprinkler heads, mist heads and/or valves	52	15	15	15	42	25	8	25	17	25	42	16
18. Apply granular fertilizer	44	4	33	15	58	17	17	8	33	17	50	0
19. Apply liquid fertilizer	37	4	11	44	42	8	8	33	0	0	17	83
20. Locate and report any malfunctions of fertilizer injection system	63	11	4	19	58	17	25	0	42	25	17	16
D. IRRIGATION PRACTICES												
1. Set time control valves (clocks)	74	4	11	7	75	25	0	0	42	25	8	25
2. Hand irrigate plants (hand watering)	41	7	7	41	58	17	8	17	17	0	8	75
3. Apply water in ditches or furrows (furrow irrigation)	93	4	4	0	92	8	0	0	100	0	0	0
4. Regulate overhead irrigation system (time clocks)	85	0	7	7	83	17	0	0	67	8	8	17
5. Regulate trickle irrigation system (ooze system)	82	0	0	15	92	8	0	0	58	8	17	17
6. Pump water for irrigation	96	0	4	0	92	8	0	0	100	0	0	0
7. Make minor electrical repairs and replace seals on irrigation supply pump	70	4	11	15	67	25	8	0	67	17	16	0

APPENDIX A-4

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY PRESENT POSITION - 1978
(Continued)

Tasks	Growers N = 27				Florists N = 12				Instructors N = 12			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
E. PLANT PEST AND DISEASE CONTROL												
1. Report disease and insect damage	41	0	7	44	42	8	42	8	8	8	17	67
2. Mix chemicals	41	0	4	52	50	17	25	8	0	0	33	67
3. Apply chemicals	33	0	7	52	42	25	25	8	0	0	33	67
4. Remove diseased plants	33	4	22	37	42	16	42	0	0	0	25	75
5. Remove weeds manually from potted plants	41	11	11	33	25	33	33	8	8	0	33	58
6. Remove weeds manually from floral crops	63	7	7	22	58	25	17	0	17	0	33	50
7. Remove weeds with tractor drawn mechanical cultivators	81	4	4	11	83	17	0	0	92	0	8	0
8. Set out poisoned bait to eradicate rodents	63	22	4	11	75	25	0	0	50	33	17	0
9. Identify and report spray damage	48	22	7	19	58	8	33	0	42	17	33	8
10. Clean spray equipment after use (nozzle, tanks, hoses, etc.)	41	4	15	33	42	8	25	25	0	8	17	75
11. Repair lines and nozzles on spray equipment	56	7	15	19	67	25	0	8	33	17	25	25
F. HARVESTING CROPS												
1. Cut flowers	56	4	11	26	50	17	0	33	17	17	33	33
2. Count and bunch flowers	59	4	15	19	50	8	8	33	42	8	33	17
3. Prepare and place cut flowers in water or preservative	52	4	7	33	33	17	8	42	17	8	42	33
4. Load potted plants for hauling	44	0	7	44	58	8	8	25	42	25	25	8
5. Remove salable plants from beds or benches	41	4	7	44	58	8	8	25	17	8	42	33
6. Dig bulbs or corms	74	11	4	7	83	8	0	8	58	25	17	0
7. Clean and size harvested bulbs	92	4	0	4	92	8	0	0	75	8	17	0
8. Dry harvested bulbs or corms	85	4	4	7	92	8	0	0	75	8	17	0

APPENDIX A-4

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY PRESENT POSITION - 1978 (Continued)

Tasks	Growers N = 27				Florists N = 12				Instructors N = 12			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
9. Treat bulbs or corms to control fungi or other disease organisms	85	4	4	7	92	8	0	0	67	17	8	8
10. Remove bedwire from harvested areas	70	15	7	4	67	17	8	8	58	25	8	8
11. Sanitize production area	44	11	15	26	58	8	25	8	17	8	33	42
G. PACKAGING, STORAGE AND SHIPMENT												
1. Grade potted flowers or foliage plants	56	0	0	41	58	8	17	17	50	17	17	16
2. Grade cut flowers	67	0	4	26	67	8	0	25	50	25	17	8
3. Remove dead and diseased plant parts	33	7	7	48	50	25	25	0	8	8	17	67
4. Place plants (floral and foliage in storage	56	4	4	33	58	8	8	25	33	8	33	25
5. Prepare invoices and shipping levels	52	7	4	33	42	8	8	42	58	8	25	8
6. Package orders for shipment	52	7	4	33	42	8	8	42	58	0	33	8
7. Assemble shipping cartons	63	4	0	30	67	17	8	8	83	8	8	0
8. Inventory plants	52	7	19	19	58	8	17	17	42	17	8	33
H. MISCELLANEOUS MAINTENANCE AND REPAIRS												
1. Grease equipment	44	7	19	22	50	17	8	25	25	25	25	25
2. Oil electric motors	44	4	26	19	42	33	8	17	42	17	33	8
3. Sharpen hand tools	41	4	30	19	42	25	17	16	17	17	50	16
4. Repair wooden greenhouse benches	48	7	33	7	58	17	17	8	67	8	25	0
5. Prepare and paint equipment	48	19	22	7	50	33	8	8	25	8	50	17
6. Paint greenhouse frames, and other structures	41	15	30	11	58	33	0	8	33	25	33	8
7. Replace and glaze broken greenhouse lights	37	0	30	26	42	25	17	16	33	17	33	17
8. Replace plastic covering on greenhouse structures	59	7	11	15	75	8	8	8	50	17	33	0

APPENDIX A-4

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY PRESENT POSITION - 1978
(Continued)

Tasks	Growers N = 27				Florists N = 12				Instructors N = 12			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
9. Repair wooden portions of the greenhouse superstructure	52	19	11	11	67	8	25	0	67	17	16	0
10. Replace damaged sections of saran	74	4	7	15	92	8	0	0	83	8	8	0
11. Replace damaged support wires for saran or black cloth	67	7	15	7	75	17	8	0	58	25	8	8
12. Replace valves on irrigation system	74	7	7	7	75	25	0	0	58	33	0	8
13. Replace gaskets on irrigation system	70	4	11	11	92	8	0	0	67	25	0	8
I. CONSTRUCTING ENVIRONMENTAL CONTROL STRUCTURES												
1. Construct greenhouse	70	19	7	4	75	25	0	0	67	25	8	0
2. Construct cold frame	81	15	4	0	75	25	0	0	50	25	8	17
3. Construct hot bed	89	4	7	0	92	8	0	0	67	8	17	8
4. Construct lath house	89	4	7	0	92	8	0	0	75	17	8	0
J. RETAILING PLANT AND FLOWERS												
1. Select cut flowers	41	0	19	37	17	8	8	67	67	0	8	25
2. Select cut foliage	41	11	19	30	17	17	8	58	67	0	8	25
3. Select flowering plants	19	4	30	44	17	8	17	58	42	0	33	25
4. Select foliage plants	22	0	26	48	17	8	17	58	50	0	25	25
5. Condition cut flowers and foliage	33	0	15	48	25	8	8	58	58	0	17	25
6. Store cut flowers	37	4	15	41	25	8	8	58	50	0	25	25
7. Inspect potted plants for pests and damage	22	15	7	52	25	17	25	33	42	0	16	42
8. Water potted plants	19	7	7	63	17	8	25	25	0	0	17	83
9. Design arrangements for the home	26	7	7	56	25	0	0	75	33	0	17	50
10. Design arrangements for weddings	30	4	11	52	25	0	0	75	42	17	8	33
11. Design arrangements for funerals	26	7	11	52	25	8	0	67	50	8	8	33

APPENDIX A-4

FLORICULTURE

REVALIDATION SURVEY OF INCUMBENT WORKERS BY PRESENT POSITION - 1978
(Continued)

Tasks	Growers N = 27				Florists N = 12				Instructors N = 12			
	1	2	3	4	1	2	3	4	1	2	3	4
	%	%	%	%	%	%	%	%	%	%	%	%
12. Design body flowers (corsages, etc.) for special events	30	7	19	41	25	0	17	58	33	0	17	50
K. MERCHANDISING PLANT MATERIALS												
1. Establish prices	22	4	0	67	8	0	17	75	8	0	58	33
2. Select advertising media	26	7	19	41	33	17	17	33	75	8	8	8
3. Prepare advertising copy and layout	37	0	19	37	42	25	17	16	75	0	17	8
4. Arrange display of stock in showroom	19	0	22	52	17	0	25	58	58	17	17	8
5. Design and locate special indoor displays	33	4	22	33	42	0	16	42	42	25	17	16
6. Design and locate special outdoor displays	59	4	15	19	58	8	8	25	67	17	8	8
7. Provide information to customer or recipient	11	0	11	70	8	0	25	67	8	17	33	42
8. Register sale of merchandise	22	0	4	67	8	0	17	75	33	25	17	25
9. Place or receive orders through wire service	30	4	7	56	25	0	8	67	92	8	0	0

APPENDIX A-5

FLORICULTURE

REVALIDATION OF TOOLS AND EQUIPMENT
1978

Tools and Equipment	Location		Time in Career Field			Present Position		
	West Virginia N-20	Pennsylvania N=32	1-5 Years N=6	6-10 Years N=10	Over 10 Years N=29	Grower N=27	Retail Florist N=12	Instructor N=12
	%	%	%	%	%	%	%	%
1. Staple Guns	95	97	100	90	96	96	100	92
2. Shovels	85	78	67	80	79	81	58	100
3. Rakes	80	75	67	80	76	77	58	100
4. Box Staplers	45	72	33	60	62	81	25	50
5 Hoes	80	72	67	70	76	77	50	100
6. All-Purpose Knives	95	91	83	100	93	96	92	83
7. Pipe Wrenches	60	62	33	60	66	67	42	75
8. Spades	65	71	67	70	69	70	50	92
9 Wheel Barrows	70	75	50	70	72	74	50	92
10. Trucks	65	66	33	50	72	81	75	25
11 Carpentry Tools	65	69	50	70	69	67	58	83
12. Oiling Cans	65	66	50	60	65	74	58	58
13. Grease Guns	50	66	16	60	65	63	33	83
14 Pick Ups	40	28	33	30	31	37	42	17
15 Labeling Pens	80	87	50	90	89	78	83	100
16. Pruning Shears	80	87	50	100	86	85	75	92
17. Standard Tractors	50	41	17	40	52	52	33	42
18 Fans	65	72	33	80	65	70	42	92
19. Trailers	25	28	17	20	28	33	8	33
20. Pruning Knives	65	66	67	70	59	56	66	83
21. Mowers	75	66	67	70	69	74	58	75
22. Roto-Tillers	60	56	33	60	62	59	42	75
23. Push Carts	45	47	33	50	45	44	25	75
24. Plant Labels	85	94	67	100	93	85	92	100
25. Spray Guns	35	53	17	40	52	59	25	42
26. Disks	20	12	0	20	14	26	0	8
27. Paint Brushes	65	78	67	60	76	74	50	92
28. Trowels	75	75	67	70	72	85	58	67
29. Hand Held Portable Sprayers	70	69	33	70	69	70	42	92
30 Time Clocks	45	62	17	60	59	48	67	58

APPENDIX A-5

FLORICULTURE

REVALIDATION OF TOOLS AND EQUIPMENT
1978

	Tools and Equipment	Location		Time in Career Field			Present Position		
		West Virginia N=20	Pennsylvania N=32	1-5 Years N=6	6-10 Years N=10	Over 10 Years N=29	Grower N=27	Retail Florist N=12	Instructor N=12
		%	%	%	%	%	%	%	%
31.	Buggies	20	16	17	20	17	7	25	33
32.	Portable Sprayers	50	69	33	60	62	63	33	83
33.	Fertilizer Injection Systems	40	53	17	50	48	44	25	75
34.	Indoor Heaters	70	47	33	60	55	59	33	67
35.	Rain Gauges	10	9	17	10	7	15	0	8
36.	Refrigerated Rooms	65	94	83	80	82	81	100	67
37.	High Pressure Hoses	35	41	17	50	41	41	25	50
38.	Wagons	35	31	17	40	31	37	8	50
39.	Centrifugal Pumps	20	25	0	40	21	30	17	17
40.	Tractor Mounted Sprayers	5	9	0	10	7	11	0	8
41.	Plow	30	28	33	30	31	33	8	42
42.	Labeling Machines	20	28	33	40	24	22	33	25
43.	Low-Clearance Tractors	5	6	0	0	7	7	0	8
44.	Tractor Drawn Sprayers	10	16	0	0	17	18	0	16
45.	Dipping Tanks	5	12	0	20	7	11	0	17
46.	Fumigating Equipment	50	50	17	50	59	59	42	42
47.	Propagation Trays	55	56	33	70	55	55	33	75
48.	Cyclone Type Fertilizer Spreaders	20	25	17	40	17	18	8	50
49.	Leveling Disks	15	9	0	20	10	11	0	25
50.	Field Heaters	5	3	0	0	7	7	0	0
51.	Solenoid Irrigation Valves	25	31	0	40	31	30	17	42
52.	Paint Compressors	10	22	0	20	21	26	8	8
53.	Spray Guns (paint)	15	19	0	30	14	30	8	0
54.	Cultivators	30	41	17	30	48	44	8	50
55.	Winches	10	6	17	10	3	11	0	8
56.	Caulking Guns	55	53	33	60	52	67	33	50
57.	Boilers (for heating and sterilization)	60	59	0	60	66	68	50	50
58.	Air-Blast Sprayers	20	22	0	20	24	22	8	33
59.	Bulb Planters	30	25	0	40	28	22	0	67
60.	Bulb Diggers	10	16	0	10	17	11	0	33

APPENDIX A-5

FLORICULTURE

REVALIDATION OF TOOLS AND EQUIPMENT
1978

Tools and Equipment	Location		Time in Career Field			Present Position		
	West Virginia N=20	Pennsylvania N=32	1-5 Years N=6	6-10 Years N=10	Over 10 Years N=29	Grower N=27	Retail Florist N=12	Instructor N=12
	%	%	%	%	%	%	%	%
61. Sweeps	10	9	0	10	10	11	0	17
62. Back Hoes	5	16	17	20	7	15	8	8
63. Chapin Irrigation Systems	30	25	0	40	28	30	8	42
64. Clippers	55	50	33	70	48	52	50	58
65. Air Conditioners	30	25	17	30	31	30	25	25
66. Glass Cutters	55	56	33	60	55	59	50	58
67. Ditcher Plows	0	0	0	0	0	0	0	0
68. Fork Lifts	15	12	0	20	10	18	17	0
69. Cooling Pads	30	31	0	40	31	30	8	50
70. Electric Trimming Shears	30	25	0	30	28	30	25	25
71. Drop Type Fertilizer Spreaders	25	12	0	30	14	11	8	42
72. Soil Sampling Probes	40	44	33	50	45	33	33	75
73. Ooze Tube or Trickle Irrigation Systems	10	16	0	10	21	7	8	33
74. Topper Mowers	5	3	0	0	7	3	8	0
75. Soil Testing Kits	65	47	33	70	59	48	33	92
76. Cement Mixers (rotating drums)	30	19	0	30	28	26	17	25
77. Hi-Clearance Tractors	0	0	0	0	0	0	0	0
78. Crawler Type Tractors	0	9	0	10	7	3	8	8
79. Turbine Irrigation Pumps	0	0	0	0	0	0	0	0
80. Bulb Sizers	0	6	0	10	50	0	0	17
81. Sleevers	40	34	17	40	41	33	42	42
82. Bulblet Diggers	0	6	0	10	3	0	0	17
83. Middle Busters	0	0	0	0	0	0	0	0
84. Can Punchers	20	0	17	0	10	4	17	8
85. Soil Injection Equipment	0	12	0	20	7	4	8	17
86. Leaf Removing Tools	20	16	17	20	14	7	33	25
87. Field Fans (frost protection)	0	0	0	0	0	0	0	0
88. Soil Shredding Machines	55	66	17	50	76	63	42	83
89. Dehumidifiers (dryers)	0	0	0	0	0	0	0	0
90. Bed Presses	0	3	0	0	3	0	0	0

APPENDIX A-5

FLORICULTURE

REVALIDATION OF TOOLS AND EQUIPMENT
1978

Tools and Equipment	Location: West Virginia N=20	Location: Pennsylvania N=32	Time in Career Field: 1-5 Years N=6	Time in Career Field: 6-10 Years N=10	Time in Career Field: Over 10 Years N=29	Present Position: Grower N=27	Present Position: Retail Florist N=12	Present Position: Instructor N=12
	%	%	%	%	%	%	%	%
91. Trucksters	0	6	0	10	3	0	8	8
92. Stake Drivers	0	0	0	0	0	0	0	0
93. Bedding Disks	0	0	0	0	0	0	0	0
94. Steam Cleaners	0	9	17	0	7	0	0	25
95. Seed Planters	30	25	33	20	34	18	25	50
96. Flail Mowers	5	6	17	0	3	7	0	8
97. Bulb Cutter	0	3	0	10	0	0	0	8
98. Soil Moisture Sensors or Tensiometers	5	9	0	10	10	0	8	25
99. Steam Rakes	0	3	0	0	3	0	0	8
100. Automatic Bending Machines	0	3	0	0	3	3	0	0
101. Automatic Potting Machines	5	6	0	10	3	4	8	8
102. Pot Cleaners	5	9	0	20	7	3	0	25
103. Artificial Flowers	75	75	83	60	79	74	92	58
104. Baskets	75	91	100	90	83	81	100	75
105. Bedwire Rollers	5	12	0	10	14	7	8	17
106. Bow Sticks	25	25	17	30	31	30	17	25
107. Cellophane	40	66	50	70	59	52	67	50
108. Coolant Injector Kits	0	0	0	0	0	0	0	0
109. Cutting Knives	80	78	67	80	90	78	75	83
110. Decorative Containers	80	81	83	80	83	81	92	67
111. Decorative Ribbons	85	75	83	80	79	74	92	75
112. Delivery Boxes	70	81	83	80	76	81	100	42
113. Dried Flowers	75	75	83	60	79	74	92	58
114. Enclosure Cards/Envelopes	65	78	100	70	72	74	92	50
115. Floral Tape	85	78	100	80	79	74	92	83
116. Foam Filled Water Pack	75	69	67	70	72	70	83	58
117. Foil	90	91	100	100	86	89	100	83
118. Gladiolus Cutters	30	12	17	20	24	18	33	8
119. Green Moss	75	62	83	60	69	67	83	50
120. Jac[illegible] Pumps	15	0	0	10	7	7	8	0

APPENDIX A-5

FLORICULTURE

REVALIDATION OF TOOLS AND EQUIPMENT
1978

Tools and Equipment	Location		Time in Career Field			Present Position		
	West Virginia N=20	Pennsylvania N=32	1-5 Years N=6	6-10 Years N=10	Over 10 Years N=29	Grower N=27	Retail Florist N=12	Instructor N=12
	%	%	%	%	%	%	%	%
121. Oasis	85	75	83	70	79	78	83	75
122. Pipe Cleaner	75	69	100	60	72	67	75	75
123 Plant Mister	50	69	67	70	62	48	92	58
124. Plastic Trays	60	81	50	80	72	74	67	75
125. Pliers	85	81	83	90	79	81	75	92
126. Propagation Box	45	56	33	80	45	48	33	75
127. Root Removing Machines	5	3	0	10	3	3	8	0
128. Scales	55	75	17	80	76	67	75	67
129. Scissors	90	97	100	100	93	93	100	92
130. Scotch/Masking Tape	95	97	100	100	97	92	100	100
131. Side Delivery Rakes	20	43	17	0	14	18	0	17
132. Wire	80	94	83	90	93	85	100	83

APPENDIX B

ADDITIONAL TASKS, TOOLS, AND EQUIPMENT, AS SUPPLIED BY SURVEY RESPONDENTS

APPENDIX B-1

FLORICULTURE

ADDITIONAL TOOLS AND EQUIPMENT

The following items were added by respondents to the tools/ equipment list of the occupational inventory survey:

A. TOOLS AND EQUIPMENT USED IN GREENHOUSES

1. Lindig Sterilizer
2. Screens - soil preparation
3. Pick machine
4. Growth retardants
5. Fertilizer
6. Lime
7. Temperature probes
8. Misting systems
9. Rooting compound
10. Seeding media
11. Picking machines for dried flowers
12. Plant bag stand
13. Tin cutters
14. Saw
15. Hammer
16. Nails
17. Roller conveyor track
18. 4-wheel drive Melroe Bobcat with bucket
19. Vertical soil conveyors
20. Flat filler
21. Wheel skid system
22. Mist nozzles on irrigation system
23. Stemming machine
24. CO_2 generators
25. Automatic vent closers
26. Hose
27. Sprinkling cans
28. Flats
29. Steamer

B. TOOLS, EQUIPMENT, AND MATERIALS USED IN RETAIL FLORAL SHOPS

1. Glue gun
2. Fresh flowers
3. Styrofoam - chopped, solid, sheets, wreaths, crosses, etc.
4. Bouquet holders
5. Wrapping paper
6. Hot wax
7. "Stickum"

ADDITIONAL TOOLS AND EQUIPMENT (continued)

8. Davies tape
9. Floral spray paint cans
10. Floral arrangement album
11. Delivery trucks
12. Plant carry-carts
13. Silk flowers
14. Porch boxes
15. Urns
16. Nosegay laces
17. Nosegay holders
18. Cones
19. Bow-making machine
20. Wire cutters
21. Sahara-foam for dried flowers
22. Electric skillet - to heat hot glue
23. Styrofoam cutter
24. String
25. Glue
26. Cardetts

APPENDIX B-2

FLORICULTURE

ADDITIONAL TASKS

The following tasks were added by respondents to the task list of the occupational inventory survey:

A. PREPARATION OF SOILS AND PLANTING MEDIA

1. Mix fertilizers "and/or lime" into media
2. Determine moisture content of soils. (Relative to plowing and cultivating soils that are too wet.

B. PROPAGATION AND PLANTING OF PLANTS

1. Rooting compounds
2. Sanitation table
3. Leaf cuttings
4. Division of plants, etc.
5. Plant callus or rooted cuttings
6. Apply fungicide to seed flats
7. Care of seedlings (water, temperature, etc.)
8. Pot cuttings
9. Place in greenhouse

C. CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

1. Fumigate
2. Spray
3. Systemic application
4. Adjust CO_2
5. Osmo coto (granular fertilizer)

D. IRRIGATION PRACTICES

1. Repair hoses.
2. Prepare liquid fertilizer for use in water system.

E. PLANT PEST AND DISEASE CONTROL

1. Fumigate
2. Systemic application

F. HARVESTING CROPS

(No additional tasks noted)

ADDITIONAL TASKS (continued)

G. PACKAGING, STORAGE AND SHIPMENT

1. Labeling products with price tags.

H. MISCELLANEOUS MAINTENANCE AND REPAIRS

1. Belts on Coolators
2. Clean Coolators
3. Repair hoses
4. Replace fan belts
5. Replace fan-jet distribution tubes
6. Check heating system for malfunction
7. Clean boilers
8. Take out and replace cooling pads
9. Light boiler
10. Replace thermocuple
11. Check for natural gas leaks (bottled fuel oil)
12. Check vents on greenhouse heaters
13. Repair fiberglass covering
14. Fix minor plumbing leaks and leaks in heating system

I. CONSTRUCTING ENVIRONMENTAL CONTROL STRUCTURES

1. "We have the superstructure of our houses built and we build the interior to our own specs."

J. RETAILING PLANTS AND FLOWERS

1. Nosegays
2. Boutonnieres
3. Design church altar flowers
4. Design flowers for hospital
5. Design wall and door hangers (mats, etc.)
6. Deliver orders
7. Wedding consultations
8. Delivery of plants and cut flowers
9. Type up cards for orders
10. Cleaning of store and cooler
11. Consult with customer for special orders
12. Select drieds, artificials and other shop accessories
13. Interior decorate offices and restaurants (plants)
14. Preparing dish gardens and terrariums
15. Packaging a floral arrangement - bouquet, corsage, etc.
16. Hospital and home flowers

ADDITIONAL TASKS (continued)

K. MERCHANDISING PLANT MATERIALS

1. Student record keeping
2. Bookkeeping to be given to accountant monthly
3. Payment of all purchase of merchandise
4. Interview employees
5. Make out orders
6. Make out check reprints
7. Make out invoices (bills)
8. Carry merchandise to customer's car
9. Provide free public classes on plant care
10. Fill orders for wholesale delivery

STUDENT MATERIAL

for

COMPETENCY-BASED EDUCATION CURRICULUM

for

FLORICULTURE

Prepared by

ASSOCIATED EDUCATIONAL CONSULTANTS, INC.

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June 1981

STUDENT CURRICULUM

INTRODUCTION

This material is designed as a student Floriculture Competency-Based Education (CBE) Curriculum. It has been developed to facilitate the learning of skills necessary for a career in floriculture--growing and selling plants and flowers. The tasks in this curriculum are those actually performed "on the job." The Student Competency Sheets are intended for use by students and/or the instructor.

A Teacher's Guide accompanies this curriculum. The guide contains an explanation of the curriculum--its validated basis, the construction and the uses. It also contains competencies by job title, an equipment list, a list of references used in the curriculum, and suggested evaluation instruments.

HOW TO USE THIS CURRICULUM

As you read the Table of Contents, you noticed that the competencies of this curriculum have been grouped into major sections called "Duties." A "duty" is a major segment, or unit, of work made up of related tasks.

A sub-group, within a Duty, is called a "Module." Each Module is made up of several closely-related "Tasks." These have been grouped together as a Module because these related skills may be learned at about the same time.

A "Task" is a job-related competency which constitutes logical and necessary steps in the performance of a segment of the worker's overall responsibilities. Another way of saying this is that a task has a definite beginning and ending point, and between the beginning and ending there are definite steps to be performed.

Each Student Competency Sheet (SCS) pertains to a single "task," which requires performance of five or more steps in order to accomplish the task. In other words, when satisfactory performance of all the "steps" is attained, as listed in the "Performance Checklist," the competence required for that "Task" has been mastered.

Turn to a Student Competency Sheet and look at the format.

In the upper section of the SCS (above the first solid line) you see "Duty" and a Roman numeral and the name of the unit on the line below the words "Student Competency Sheet." The second line shows Module A or B or C, etc., and the name of the group of related tasks. The third line tells you the number (1, 2, 3, etc.) and the name of the Task. This is the job-related competency.

What To Do With a Student Competency Sheet

The first major section of the Student Competency Sheet (SCS) is the "Performance Checklist." The steps listed here serve two purposes. First, they tell exactly what must be done to perform the task. The steps are listed in order. The task can be performed by following the Performance Checklist as it is numbered. As the steps are performed, evaluation can be done. Thus, the second use of the Performance Checklist is as a competency-based "test": can this job be done or do skills need to be sharpened in one or more of the steps?

The second section on the SCS tells more about the competency "test." The "Test" portion lists:

1. Items Needed - what will be needed (equipment, tools, materials, etc.) to perform the task.
2. Task - what must be done.
3. Standard - how well the task must be done or, in other words, the standard to which the task must be performed.

The last section of the SCS suggests "Learning Activities" which are recommended in order to be able to perform the task. They include things that can be read, seen, and heard. And they suggest situations for practicing skills related to the task. Many additional activities are possible. By the time some or all of the Learning Activities have been completed, why and how to perform the task should be mastered.

Performance means:

1. Understanding why the task is done and what's involved in understanding the why's.
2. Being able to perform the task efficiently and effectively.
3. Being able to feel comfortable while performing the task and becoming a "good" worker. A "good" worker should be cooperative, confident, and be able to relay confidence to others.

Some Student Competency Sheets are too long to fit on one (1) page. Don't overlook that second page!

SCS Packets

Some Student Competency Sheets will have extra pages immediately following them. These pages may be Information Sheets, which supplement textbook or audio-visual information. There may also be a Self-Check Test. (Questions on a Self-Check Test should be answered without looking at the answers. After completing the test, then answers can be checked and discussed.) There may be a "Performance Check Sheet," which is also a guide. Sometimes the items on the Performance Check Sheet are exactly as listed in the Performance Checklist on the SCS: other times, two or more steps may be combined for evaluation purposes.

These supplements to an SCS will be keyed in the upper right-hand corner of the page. For example, I-A-1 means Duty I, Module A, Task 1. When additional pages are included after the first page of a Student Competency Sheet, each page will be identified, for example, as $\genfrac{}{}{0pt}{}{\text{I-A-1}}{2}$, $\genfrac{}{}{0pt}{}{\text{I-A-1}}{3}$, etc.

The only exception to this numbering system are Duties A and B. For these duties there are no Modules. There are only Tasks. To distinguish these duties from those which are related to specific floriculture competencies, the duties have been called "A" and "B", and the Tasks are numbered as 1, 2, 3, and 4. Therefore, additional pages which accompany the SCS for Duty A, Task 1, are called $\overset{\text{A-1}}{2}$ and $\overset{\text{A-1}}{3}$.

When working with a Student Competency Sheet, be sure all the pages included for that task are identified. Also, check to see if any other supplemental material is available.

DUTY A

EMPLOYMENT OPPORTUNITIES

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Know where and how to look for a job.
- Write a personal data sheet (resume).
- Complete a job application form.
- Be prepared for a job interview.

Student Competency Sheet

Duty A: EMPLOYMENT OPPORTUNITIES

Task 1: LOOK FOR A JOB

Performance Checklist

1. Check the Dictionary of Occupational Titles for occupational titles in floriculture that interest you.
2. Check the Occupational Outlook Handbook for information relating to each of these jobs.
3. Consult the local telephone book for florists, greenhouses and nurseries that hire employees with the job titles that interest you.
4. Make a list of the employers' names, addresses and telephone numbers.
5. Look in the Classified Ads section of local, regional and statewide newspapers for employers that are looking for employees with floriculture job titles that interest you.
6. Make an appointment with the school placement officer (if one is available) or the guidance person in charge of job placement. Find out what jobs are available on the local, regional, state and national level. (Find out also what degree of training and experience is usually required for these jobs. Discuss with the counselor the possibilities for additional training after high school: schools which offer courses or programs you are interested in, possibilities for financial aid, and how to apply for financial aid.)
7. Visit local employers and find out what the working conditions are, distance needed to travel, employee benefits, competencies needed, and salary for the job you are interested in.

Test

Items Needed:

1. What Color Is Your Parachute?, Bolles, Penn Speed Press.
2. Dictionary of Occupational Titles, U.S. Department of Labor, Employment and Training Administration.
3. Occupational Outlook Handbook, U.S. Department of Labor, Bureau of Labor Statistics.
4. Local, regional and statewide newspapers.
5. Telephone directories (Yellow pages).
6. Paper
7. Pencil

Task: Research the employment opportunities in floriculture occupations.

Standard:
1. Must be able to identify several (at least three) jobs that interest you.
2. Must be able to describe the responsibilities of floral designer/grower.
3. Must be aware of the employment market for jobs that interest you.
4. Must be able to match competencies you have developed with those necessary to obtain a job or jobs that interest you.

Learning Activities

1. Read:

   a. What Color Is Your Parachute?
   b. Pages 594-600, Retail Merchandising (Wingate and Sampson), 8th ed., South-Western Publishing Co., 1975.

2. See and participate in Units IX and X, "Job-Seeking Skills," Job Survival Skills Program. (Singer, 1973.)

3. Read Information Sheet A-1. Then read the Dictionary of Occupational Titles (the 142, 405, 406, 408, 409 series, all of which pertain to floriculture). Pick at least three (3) jobs that interest you. Investigate and discuss:

   a. A list of competencies needed.
   b. The average starting salary (in your locale).
   c. Where the jobs are located.
   d. Advantages and disadvantages.

4. Take notes from a lecture by your instructor on opportunities in floriculture.

5. Write separate lists of:

   a. Things you like to do.
   b. Things you do not like to do.
   c. Things you feel you do well.
   d. Things other people have complimented you on.
   e. Equipment you can use.
   f. Jobs you feel you would like to have.
   g. Places you would like to live and work.
   h. Your living expenses when you are working. (Be reasonable--"cut out the fat.")

6. Read the Occupational Outlook Handbook. (Check the index for job titles you selected from the Dictionary of Occupational Titles.) Then, discuss with classmates:

   a. The nature of the work.
   b. Places of employment.

c. Training, other qualifications, and advancement.
d. Employment outlook.
e. Earnings and working conditions.

7. Interview a person who is currently employed in a job in floriculture that interests you. Report a description of this job to the class:

   a. Entry requirements
   b. Beginning salary
   c. Opportunities for promotion
   d. Highest possible salary
   e. Benefits

   (Note: The salary of the person you interview will probably be considered privileged information.)

8. Write a case study of a person who has had at least two years' experience as a flower grower, designer, or salesperson.

9. Complete all the activities on the Performance Checklist.

10. Look for a job that interests you. If you are actually looking for a job, apply at as many places as you can find. Don't stop with one and "just hope."

11. Read Chapter 38, General Office Practice, 3rd Ed., Archer, Brecker, Frakes, Stewart. (McGraw-Hill, 1968) or Part 49, General Business for Economic Understanding, 11th Ed., DeBrum, Haines, Malsbary, Daughtrey. (Southwestern Publishing, 1976).

Information Sheet A-1

LOOK FOR A JOB

D.O.T. Code 142.081-010

FLORAL DESIGNER (retail trade) florist

Designs and fashions live, cut dried, and artificial floral and foliar arrangements for events, such as holidays, anniversaries, weddings, balls, and funerals.

Confers with client regarding price and type of arrangement required.

Plans arrangement according to knowledge of design and properties of materials, or selects appropriate standard design pattern.

Selects flora and foliage necessary for arrangement.

Trims material and arranges bouquets, sprays, wreaths, dish gardens, terrariums and other items, using wire, pins, floral tape, foam, trimmers, cutters, shapers, and other materials and tools.

Decorates buildings, halls, churches, or other facilities where events are planned.

Packs and wraps completed arrangements.

May estimate costs and price arrangements.

May conduct classes or demonstrations.

May instruct and direct other workers.

May arrange according to standard designs or under instruction of designer and be designated FLORAL ARRANGER.

Dictionary of Occupational Titles, 4th Edition, 1977, p. 83.

Student Competency Sheet

Duty A: EMPLOYMENT OPPORTUNITIES

Task 2: WRITE A PERSONAL DATA SHEET (RESUME)

Performance Checklist

1. Gather all the important information about you in the following areas:
    - a. Education you have had.
    - b. Work experience you have had.
    - c. Your accomplishments or honors.
    - d. Relevant personal information.
    - e. Names of people who know what type of person you are.
2. Assemble this information in outline form as follows:
    - a. Personal information
      Name, address, telephone number, year of birth, health.
    - b. Education and Training
      Name and address of high school, grade level completed, work-related subjects completed. If your instructor maintains a list of competencies you have mastered, include the information that such a list is available to your prospective employer.
    - c. Military Service
      Branch of service, rank at time of discharge, type of duty assignments.
    - d. Employment (Work Experience)
      List in order, beginning with the most recent and going back to your first employment. List: employer, dates, job title, duties, supervisor and reason for leaving. Include work done on a co-op or on a volunteer basis. Briefly describe each job you had.
    - e. Awards, Licenses, Honors and Organizations
      Include any honors or offices held during school years in FFA or other club activities.
    - f. Interests and hobbies
    - g. Personal References
      Names, addresses and telephone numbers of three people you feel would recommend you for employment. (NOTE: Always ask the person first before using someone's name.)

Test

Items Needed:
1. Paper
2. Pen or pencil
3. Typewriter (recommended)

Task: Organize personal information about yourself to write a personal data sheet (sometimes called a "resume").

Standard: 1. The personal data sheet will be complete.
2. The personal data sheet will be written in a neat, orderly fashion (typewritten if possible).

Learning Activities

1. Read pp. 600-609, Retail Merchandising (Wingate and Sampson), 8th Ed., South-Western Publishing Co., 1975.

2. If you do not already have a social security card, ask the school guidance counselor or placement officer how you can get one.

3. Develop a personal data sheet (resume) by following the steps outlined in the Performance Checklist:

   a. Use Information Sheet A-2 as a guide to assemble information, then
   b. Write (neatly in pen) or type a personal data sheet (resume). You may use Information Sheet A-2 as a guide.

4. Read page 585, General Business for Economic Understanding, 11th Ed., DeBrum, Haines, Malsbary, Daughtrey. (Southwestern Publishing, 1976).

5. See and participate in Unit XI, "Resume," of Job Survival Skills Program. (Singer, 1973.)

Information Sheet A-2

WRITE A PERSONAL DATA SHEET (RESUME)

ROBERT T. JOBSEEKER

Personal Data:

Address: 107 Main Street
Charleston, West Virginia 25000

Telephone: (304) 123-4567

Date of Birth: April 4, 1963

Physical Condition: Excellent

Job Objective: Floral Designer

Education:

John Jay High School 124 Constitution Avenue Charleston, West Virginia 25000	Graduated 1981. Vocational education: one year (completed 1979) of Floriculture program at John Quincy Adams Vocational Center
John Adams Junior High School 248 Constitution Avenue Charleston, West Virginia 25000	Attended 1976-1978
George Washington Elementary School 400 Constitution Avenue Charleston, West Virginia 25000	Attended 1969-1976

Work Experience:

Employer: Mountain State Nursery
603 Green Road
Charleston, West Virginia 25000

Dates: June 1980 - September 1980

Job Title: Flower Picker/Hauler

Duties: Harvested flowers, and transported harvested crops.

ROBERT T. JOBSEEKER
Page two

Work Experience (continued)

Salary: **$3.10 per hour**

Supervisor: **Mr. Tom Jeffers**

Reason for Leaving: **Return to school**

Awards, Honors and Organizations:

Future Farmers of America (FFA)
Chapter Secretary (1980-81)

Student Council Representative - John Adams Junior High School

Interests and Hobbies:

Jogging, gardening, bowling

References

Mrs. George Bush
Mountain State Nursery
603 Green Road
Charleston, West Virginia 25000 (304-123-0000)

Mr. Harvey Jordan
Floriculture Instructor
John Quincy Adams Vocational Center
111 Mt. Vernon Road
Charleston, West Virginia 25000 (304-000-9654)

Mr. Theodore Sorens
126 Wheeler Street
Charleston, West Virginia 25000 (304-123-4567

Student Competency Sheet

Duty A: EMPLOYMENT OPPORTUNITIES

Task 3: COMPLETE A JOB APPLICATION FORM

Performance Checklist

1. Read the application form carefully before filling it out.
2. Refer to your Personal Data Sheet (resume). Fill out all the blanks as they apply to you.
3. Draw a short line in the blanks that do not apply, or write N/A (not applicable).
4. Either print or write, as directed. (NOTE: Never use both.)
5. Use either a pen or a clear-writing pencil. (NOTE: Never use both.)
6. Do not use abbreviations.
7. Be neat, accurate, and honest with all information.
8. Always write your signature.
9. Do not write in the blanks that are to be used by the company.

Test

Items Needed:
1. Your Personal Data Sheet
2. Job application form
3. Ballpoint pen or pencil

Task: Complete the application form.

Standard:
1. The directions printed on the application form will be completed with 100% accuracy.
2. All information filled in on the application will be spelled correctly.
3. The completed application will appear in a neat form.
4. The completed application must be approved by your instructor.

Learning Activities

1. Locate the following information needed to successfully complete a job application form: (See Information Sheet A-3)

   a. Personal Data
      (1) Date of application
      (2) Name
      (3) Social Security Number (SSN)
      (4) Telephone number, including area code
      (5) Residence, including ZIP code
      (6) Years at present address
      (7) Date available to start work

- b. Educational Information
  - (1) High school credits
  - (2) Courses taken
  - (3) Class rank
  - (4) Co-curricular activities
  - (5) Extra-curricular activities
  - (6) Special awards and recognitions
- c. Military Information
- d. Previous Employment

2. Read pp. 612 and 613, Retail Merchandising.

3. Read and learn the terms listed on Information Sheet A-3. ("Terms to Know to Fill Out a Job Application"). Discuss these terms with your class.

4. Take the self-check test supplied by your instructor. (See Self-Check Test A-3.)

5. Research and discuss:

   - a. Kinds of information which may be asked on a job application form.
   - b. Kinds of information which may not legally be asked by an employer:
     - (1) on a job application form.
     - (2) during a job interview.

6. Fill out an application form provided by your instructor or an employer. Use the Performance Checklist whenever needed.

7. See and participate in Unit XII, "Packaging Your Skills: Application" in Job Survival Skills Program, Singer Career Systems, Rochester, NY, 1973.

8. Read: Pages 585-588, General Business for Economic Understanding, 11th Ed., DeBrum, Haines, Malsbary, Daughtrey, (Southwestern Publishing Co., 1976), or pages 522-523, General Office Practice, 3rd Ed., Archer, Brecker, Frakes, Stewart, (McGraw-Hill Book Company, 1968).

Information Sheet A-3

TERMS TO KNOW TO FILL OUT A JOB APPLICATION

1. Nationality - country where a person is born.
2. Guardian - person in charge of the legal care of a youth.
3. Number of dependents - individuals who depend upon you for their support.
4. Ethnic group - caucasian (white), negroid (black), Indian, Asian, or other.
5. Limitations - health or physical condition that may hinder a person on the job.
6. Capabilities - things you can do well.
7. Compensation - pay for time not able to work.
8. Naturalized citizen - a person who has gone through the legal process to become a U.S. citizen.
9. Natural born citizen - a person who is born in a country.
10. Fringe benefits - things given an employee other than money.
11. Wage - the hourly rate of pay.
12. Salary - monthly or yearly contract payments.
13. Supervisor - a person who works for another person or company.
14. Employee - a person who works for another person or company.
15. Employer - a person or company who hires another.
16. O.A.S.I. - Old Age Survivors Insurance.
17. Deduction - that which is taken from a pay check.
18. Federal withholding - tax money taken out for the U.S. Government.
19. State withholding - tax money taken out by the State Government.
20. Annuity - a form of saving money.
21. Gross Pay - the total amount paid before deductions.
22. Take home pay - the amount that is taken home.
23. Management - those who make decisions.
24. Personnel Manager - person who is in charge of people.
25. Job interview - the person-to-person contact between employee and employer.
26. F.I.C.A. - (Federal Insurance Compensation Act) - money taken out for Social Security.

SELF-CHECK TEST
A-3

Define the following terms:

1. Nationality - ____________________
2. Guardian - ____________________
3. Number of dependents - ____________________
4. Ethnic group - ____________________
5. Limitations - ____________________
6. Capabilities - ____________________
7. Compensation - ____________________
8. Naturalized citizen - ____________________
9. Natural born citizen - ____________________
10. Fringe benefits - ____________________
11. Wage - ____________________
12. Salary - ____________________
13. Supervisor - ____________________
14. Employee - ____________________
15. Employer - ____________________
16. O.A.S.I. - ____________________
17. Deduction - ____________________
18. Federal withholding - ____________________
19. State withholding - ____________________
20. Annuity - ____________________
21. Gross Pay - ____________________
22. Take home pay - ____________________
23. Management - ____________________
24. Personnel Manager - ____________________
25. Job interview - ____________________
26. F.I.C.A. - ____________________

Student Competency Sheet

Duty A: EMPLOYMENT OPPORTUNITIES

Task 4: PREPARE FOR A JOB INTERVIEW

Performance Checklist

1. Write a letter of application and ask for an interview. Or, go directly to the employer and ask for an interview.
2. Secure as much information as possible about the company and its services before the interview. Know what kind of work is performed and the qualifications you must have to perform the job.
3. Get a good night's sleep before the interview.
4. Before going to the interview, make sure you have taken a shower or bath, brushed your teeth, combed your hair and put on clean, neat clothes.
5. Be prompt for the interview.
6. Go alone.
7. Look pleasant.
8. Introduce yourself in a quiet, pleasant way.
9. Shake hands firmly.
10. Sit erect (if the prospective employer indicates that you should sit down).
11. Avoid signs of nervousness (such as tapping fingers or foot).
12. Look the interviewer in the eye.
13. Be ready to describe your competencies and qualifications to the interviewer.
14. Be ready to take a performance test if the job requires it.
15. Leave discussion of salary to the end of the interview.
16. Thank the interviewer before you leave.
17. Every interview should be followed up with a letter of appreciation.

Test

Items Needed:
1. An employer (either an actual prospective employer or another student who will act as interviewer).
2. List of competencies you have developed (or a simulated list).
3. Pen.
4. List of questions to ask, things to remember at the interview.

Task:
1. Prepare for a job interview.
2. Have a job interview (by a prospective employer or another student).

Standard: Your instructor will evaluate your preparation and performance.

Learning Activities

1. Complete the Pretest (Self-Check Test A-4).

2. Read:

    a. Pages 609-612, Retail Merchandising.
    b. Page 588, General Business for Economic Understanding, 11th Ed., DeBrum, Haines, Malsbary, Daughtrey, (Southwestern Publishing Co., 1976), or read pp. 519-521, General Office Practice, 3rd Ed., Archer, Brecker, Frakes, Stewart (McGraw-Hill, 1968).

3. Write a letter of application. (See Information Sheet A-4.) You may also refer to pp. 606-608, Retail Merchandising.

4. Develop a list of competencies you have mastered (in floriculture/ floral shop operation).

5. See and participate in Unit XIII, "Interview," Job Survival Skills Program (Singer, 1973.)

6. Read the following Information Sheets for this task:

    a. "Interviewing: A Skill, Not a Mystery" (Information Sheet A-4a)
    b. "Some Frequently Asked Questions During the Interview" (Information Sheet A-4b)
    c. "Things to Remember at the Interview" (Information Sheet A-4c)
    d. "Factors Which Frequently Lead to Rejection of the Applicant" (Information Sheet A-4d)

7. Use Information Sheet A-4b (from Learning Activity 6b, above):

    a. Study the "Frequently Asked Questions." Check (✓) those you feel are in violation of Civil Rights Laws.
    b. Discuss with your class, the questions you checked:
        (1) Are they discriminatory? Do they legally violate the civil rights of any "protected" group (race, color, national origin, sex, handicap)?
        (2) If the questions are discriminatory, how would you respond if a prospective employer asked them?

8. Before going to the interview, develop a check list of things you want to ask.

9. Before going to the interview, develop a list of things to remember to tell the interviewer about yourself. Keep this in a coat pocket or wallet, but use it only when needed.

10. Complete "Check List to be Used Before Going for an Interview" (Information Sheet A-4e).

11. Practice with another student. Take turns being the interviewer and the applicant. Use the Performance Checklist as a guide.

SELF-CHECK TEST
A-4

Pretest*

1. Prior to an interview, a well-prepared applicant should:
   a. Rely on memory to answer or fill out any questions.
   b. Be prepared to answer questions by composing his own questions and answers.
   c. Answer all questions "off the top of the head."

2. For the interview, an applicant should:
   a. Wait for the interviewer to explain what the company's business is.
   b. Not worry about the company and just interest himself/herself in a specific job.
   c. Research the company.

3. In preparation for the interview, an applicant should:
   a. Locate the company prior to the interview.
   b. Leave early enough to find the company on the day of the interview.

4. Appropriate dress for an interview might be:
   a. Blue jeans and a shirt.
   b. Your best dress-up clothes.
   c. Clean, neat clothes appropriate to the company and the job you're applying for.

5. When an interview is scheduled for 10:00 a.m., the applicant should:
   a. Not worry about being ten (10) minutes late.
   b. Be punctual.
   c. Arrive an hour early.

6. When speaking with the interviewer, an applicant should:
   a. Emphasize good points.
   b. Tell the interviewer he/she didn't do so well in some skills or courses.
   c. Avoid the whole truth.

7. To answer any questions an interviewer might ask, an applicant should:
   a. Be honest, factual and sincere.
   b. Make up something if he doesn't know the answer.
   c. Lie if necessary to make a good impression.

8. If asked, "What can you do?" an applicant should:
   a. Avoid saying, "I'll do anything."
   b. Tell the interviewer, "It depends."
   c. Say, "I'll do anything."

Self-Check Test (Continued)

9. When speaking to an interviewer, an applicant should:
   a. Try to look the interviewer in the eye.
   b. Read the pre-written paper.
   c. Look around the room.

10. An appropriate response to end an interview might be:
   a. "Thank you."
   b. "See you later."
   c. "Please pick me."

11. If an applicant never hears from the company, he/she should:
   a. Never apply for another job.
   b. Tell friends never to apply there.
   c. Not be discouraged.

12. If an applicant doesn't get the job, he/she should:
   a. Analyze why.
   b. Forget about the interview.
   c. Blame it on the interviewer.

13. If an applicant doesn't get the job, he/she should:
   a. Mourn.
   b. Keep trying.
   c. Be content to be unemployed.

*No answers are provided for this pretest. Instead, use each item as a discussion item with your instructor and class. Also, look for the correct answers as you complete the other Learning Activities for this task.

Information Sheet A-4

124 Main Street
Charleston, West Virginia 25000
June 10, 19__

Mr. James Madison
Manager
Green Gate Florists, Inc.
249 Maple Avenue
Charleston, West Virginia 25003

Dear Mr. Madison:

In response to your ad for Floral Designer in the Sunday, June 9, 19__, edition of The Charleston Post, I am enclosing a resume.

I have recently completed the Floriculture program at John Quincy Adams Vocational Center, where I satisfactorily completed all the required competencies for this program.

My experiences in school and in the Flower Arranger position at Mountain State Florists will indicate to you that I am very much interested in a career as a Floral Designer. You will note also that I have had a great deal of leadership experience through FFA, which will indicate both my interest in floriculture and potential to be an asset to your business.

I would appreciate your consideration of me as a member of your organization. I can be contacted for an interview at 123-4567.

Thank you very much.

Sincerely,

Nancy Jean Jobseeker

Enclosure

Information Sheet A-4a

INTERVIEWING: A SKILL, NOT A MYSTERY*

I. GETTING READY FOR AN INTERVIEW

1. Figure out what you really want to do. Be specific. Make a list of exactly what you want AND of what you don't want. Look at what you've done in the past--education, summer jobs, hobbies, clubs, etc. Get help from your counselor. You've got to have some idea of what you're after.

2. Learn everything you can about the company. Read any literature you can find to learn about job openings and what they are like, company benefits, etc. Talk to people who work or have worked for the company. The more you know before the interview, the fewer unnecessary questions you'll have to ask--and the interviewer is bound to be impressed if you've "done your homework."

3. Role-play an interview with a friend, taking turns as interviewer and applicant. This way you'll know the routine of an interview and will be more relaxed when it's for real. Talk to others who have been interviewed (by the company you're applying to if possible).

4. Be fair to yourself--be sure the interviewer knows all about you and what you can do. This means learning to fill out job applications correctly. DON'T give incomplete answers. DON'T fill out the application hurriedly--be sure it's neat and written as clearly as you can. Print everything but your signature. You'll do a better job of giving all the information about yourself if you take along your Personal Data Sheet (Resume). (Some companies use an information form similar to the Personal Data Sheet in addition to the job application form.)

II. WHAT INTERVIEWERS LOOK FOR

1. An interview is short. The interviewer must learn a lot about you in a very short time. The basic purpose of the interview is to exchange enough information to screen you from a number of other applicants. They have to decide whether the company should talk with you further and keep your name on the applicant list.

2. First impressions will be noted. The interviewer usually makes notes of the first impression, so making a good first impression is an asset to you and to the company you'd like to work for. During the interview, other general traits will also be noted: poise, ability to communicate, social skills and personality. In short, the interviewer only sees you once and the impression you leave is what the interviewer sees as a general picture of you.

Information Sheet A-4a (Continued)

3. An interviewer wants to find out exactly what you think you want and why, what kind of work you're looking for, and how interested you are in that work. Interviewers also look for career goals, drive to accomplish those goals, interest in further education, further training and such other things as preferred location and your willingness to relocate if necessary.

4. The purpose of telling the interviewer what you've done is to help indicate if your work interests seem to match your talents. Your qualifications will be reviewed: Jobs, grades, skill level, special training, hobbies and extracurricular activities.

5. If you do seem qualified for a certain kind of work, the interviewer has to see if the company has a job area that might match your interests. If so, they'll explain the details of the work and see if you are interested and just how interested.

III. HOW TO ACT DURING AN INTERVIEW

1. Be yourself. DON'T "act." The only company you are likely to be happy working for is one that likes you just the way you are. Very few people can play roles well enough to fool an interviewer, who has met and talked to a great many people.

2. Don't overdo it. Act professionally and naturally. Be on time! Be friendly, but not too casual. Be courteous. Have your thoughts and questions well organized.

3. Don't be afraid to tell the interviewer all about yourself. Don't answer questions with just a yes or no. Take this opportunity to tell about your goals and strong points. This may alert an interviewer to terrific information about you that didn't show up on the resume. Open up!

4. Tell it like it is. A lie is often an attempt to hide a problem that will only get in the way later. Be completely honest. If you have no interest in a particular kind of work or job, say so. You should be trying to screen the company too.

Information Sheet A-4a (Continued)

IV. WHAT TO EXPECT AFTER AN INTERVIEW

1. Don't expect to be hired on the spot. It's usually not the role of the interviewer to do the hiring. Interviewers only make screening decisions to determine whether the company should talk with an applicant further. By the end of the interview, most companies will try to tell you as clearly as possible what to expect next.

2. Interviewers rarely promise anything, even when they think the applicant is highly qualified. But if they feel you'll be under active consideration, they'll usually indicate that you can expect a second interview or that they'll contact you later.

3. Write to the interviewer after the interview if you're interested. Mention the interviewer's name, time and date of the original interview plus important points discussed. If it's a small company, especially, and you haven't heard anything in a week, call back. Sometimes applications get moved to the bottom of the stack. Remind the interviewer of your interest. Keep on learning about the company.

4. If you get a "NO" answer, it's probably because your interests and the company's don't match. Don't worry, just analyze "why." Almost everyone hears a "no" before a job is landed. Look at it as a learning experience: you've learned about interviewing, about your likes, a company's needs, and you've got great experience to go ahead to another company much better suited to you.

*Adapted from "What Students Should Know About Interviewing," General Electric, Educational Communications Programs, Fairfield, CT 06431, 1978.

Information Sheet A-4b

SOME FREQUENTLY ASKED QUESTIONS DURING THE INTERVIEW*

1. What are your future vocational plans?
2. In what school activities have you participated?
3. How do you spend your spare time? What are your hobbies?
4. In what type of position are you most interested?
5. Why do you think you might like to work at our company?
6. What jobs have you held? Why did you leave?
7. What course did you like best in school? Least? Why?
8. What do you know about our company?
9. Do you feel that you have received good general training?
10. Why do you feel that you will be successful in your field?
11. What extracurricular offices have you held?
12. What are your ideas on salary?
13. Do you prefer any specific geographic location? Why?
14. How much money do you expect to earn at the age of 20? 35?
15. How did you rank in school?
16. Do you think that your extracurricular activities were worth the time devoted to them?
17. What personal characteristics are necessary for success in your field?
18. What is your father's occupation?
19. Are you looking for a permanent or temporary job?
20. Do you prefer working alone or with others?
21. Can you take instructions without feeling upset?
22. Tell me a story.
23. Are you primarily interested in making money or do you feel that service to your fellowmen is satisfactory pay?

Information Sheet A-4b (Continued)

24. Do you live with your parents?

25. Can you get recommendations from previous employers?

26. What interests you about our products and services?

27. Do you feel you have done the best scholastic work of which you are capable?

28. How long do you expect to work?

29. Have you ever had any trouble getting along with fellow students?

30. Have you saved any money?

31. Do you have any debts?

32. Do you attend a church?

33. Do you like routine work?

34. What size city do you prefer?

35. What is your major weakness?

36. Will you work hard to get ahead?

37. Are you eager to please?

38. What do you do to get in good physical condition?

39. Have you had serious illnesses or injuries?

40. Are you willing to relocate if the company wishes?

41. What job in the company would you like most to have?

42. Is it difficult for you to get along with people who have different backgrounds and interests than you?

43. Do you use liquor? How much?

44. Should an employer consider your grades? Why?

45. Would you be willing to work overtime? How much?

46. Do you possess any special skills or abilities?

47. What have you done that indicates initiative and desire to work.

Information Sheet A-4b (Continued)

48. You have a complaint about your job or working condition. How would you handle it?

49. You and a fellow worker are having differences about your jobs. What would you do?

50. You have an idea you feel will help the company. What would you do?

*Courtesy of the Virginia Polytechnic Institute and State University Agriculture Education Department, Blacksburg, Virginia, in cooperation with the Agriculture Education Service, Division of Vocational Education - State Department of Education, Richmond, Virginia.

Information Sheet A-4c

THINGS TO REMEMBER AT THE INTERVIEW*

1. Sit up straight.
2. Speak in a quiet, pleasant voice.
3. Try to answer all questions correctly.
4. Never talk about personal problems.
5. Be respectful.
6. Use your best English at all times.
7. Know or write down the questions you wish to ask during the interview.
8. Never smoke or chew gum during the interview.
9. Inquire as to what follow-up procedure is required.
10. School subjects you liked best, extracurricular activities.
11. Your educational plans.
12. Ask some questions about the firm.
13. If you've ever been employed, be able to list employer, name of firm, date employed, address, salary and reason for leaving.

*Courtesy of the Virginia Polytechnic Institute and State University, Agriculture Education Department, Blacksburg, Virginia, in cooperation with the Agriculture Education - State Department of Vocational Education, Richmond, Virginia.

Information Sheet A-4d

FACTORS WHICH FREQUENTLY LEAD TO REJECTION DURING THE JOB INTERVIEW

In the 1969 survey by Penn Tech Institute (Pittsburgh, Pennsylvania), the following factors were reported by 153 companies as having led to the rejection of the applicant during the employment interview.

1. Poor personal appearance.
2. Overbearing - overaggressive - conceited "Superiority complex" - "know-it all."
3. Inability to express himself clearly - poor voice, diction, grammar.
4. Lack of planning for career - no purpose and goals.
5. Lack of confidence and poise - nervousness - ill-at-ease.
6. Lack of interest and enthusiasm - passive, indifferent.
7. Failure to participate in activities.
8. Overemphasis on money - interested only in best dollar offer.
9. Poor scholastic record - just got by.
10. Unwilling to start at the bottom - expects too much too soon.
11. Makes excuses - evasiveness - hedges on unfavorable factors in record.
12. Lack of tact.
13. Lack of maturity.
14. Lack of courtesy, ill-tempered.
15. Condemnation of past employers.
16. Lack of social understanding.
17. Marked dislike for school work.
18. Lack of vitality.
19. Fails to look interviewer in eye.
20. Limpy, fishy hand-shake.
21. Indecision.
22. Loafs during vacations - lakeside pleasures.
23. Unhappy married life.
24. Friction with parents.
25. Sloppy application blank.
26. Merely shopping around.
27. Wants job only for short time.
28. Little sense of humor.
29. Lack of knowledge in field of specialization.
30. Parents make decisions for him.
31. No interest in company, or in industry.
32. Emphasis on whom he knows.
33. Unwillingness to go where we send him.
34. Cynical.
35. Low moral standards.
36. Lazy.
37. Intolerant - strong prejudices.
38. Narrow interests.
39. Spends too much time in movies.
40. Poor handling of personal finances.
41. No interest in community affairs.
42. Inability to take criticism.
43. Lack of appreciation of value of experience.
44. Radical ideas.
45. Late to interview without good reason.
46. Never heard of company.
47. Failure to express appreciation for interviewer's time.
48. Asks no questions about the job.
49. High pressure type.
50. Indefinite response to questions.

Information Sheet A-4e

CHECK LIST TO BE USED BEFORE GOING FOR AN INTERVIEW*

		Yes	No
1.	Did I plan ahead for the interview?	____	____
2.	Am I nervous when I meet people?	____	____
3.	Do I ask intelligent questions?	____	____
4.	Do I become tense when asked questions?	____	____
5.	Am I highly emotional?	____	____
6.	Do I take pride in my appearance?	____	____
7.	Do I listen when someone else is talking?	____	____
8.	Do I look at the speaker?	____	____
9.	Do I practice good posture?	____	____
10.	Do I use proper English?	____	____
11.	Do I think before answering?	____	____
12.	Do I answer honestly?	____	____

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*Check list courtesy of the Virginia Polytechnic Institute and State University, Agriculture Education Department, Blacksburg, Virginia, in cooperation with the Agriculture Education Service, Division of Vocational Education, State Department of Education, Richmond, Virginia.

DUTY B

HUMAN RELATIONS

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Understand your personality and needs.
- Understand the principles involved in successful work attitudes.
- Be able to influence the behavior of others by successful use of motivating factors.

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Student Competency Sheet

Duty B: HUMAN RELATIONS

Task 1: UNDERSTAND YOURSELF

Performance Checklist

1. Analyze yourself (interests, aptitudes, abilities, personality traits).
2. Analyze your needs (personal, financial).
3. Explore possible careers which will match your personal characteristics and your needs.
4. Set a career goal.
5. Establish short term goals that will help you reach your career goal.

Test

Items Needed:

1. Paper
2. Pen or pencil
3. Envelope

Test:

1. Demonstrate that you understand yourself--your personality and needs.
2. Demonstrate that you can relate knowledge of yourself to career plans.

Standard:

1. Your evaluation of your personality traits, as shown by you on the "Personality Rating Sheet" (Information Sheet B-1) will include a plan to improve any traits rated as "Fair," "Poor," or "Very Poor."
2. You will correctly answer 10 of the 12 questions on the test for this task.

Learning Activities:

1. Read pp. 616-621, Retail Merchandising.
2. Read pages 81-94, Succeeding in the World of Work.
    a. Make a vocabulary list of new words.
    b. Learn what these words mean.
    c. Discuss the meaning of the words with several classmates.

3. Rate your own personality, using the "Personality Rating Sheet" (Information Sheet B-1). Then:

    a. List your personality traits which need improvement (anything not rated as "Good" or "Excellent"). Try to be honest and objective. (Most of us can use some improvement.)
    b. You may discuss your goals with your instructor to get helpful suggestions for improving personality traits which may affect your career plans.
    c. Write your plan for improving any areas not rated as "Good" or "Excellent."
    d. Obtain an envelope from your instructor. Place your evaluation in the envelope. It will be placed in your folder. At the end of the semester, get this envelope and rate yourself again. Note the improvements.

4. See and participate in the following units of Job Survival Skills Program:

    a. Unit I, "Introduction"
    b. Unit II, "Education and Training"
    c. Unit IV, "Self-Concept and Employment"

5. Read pages 95-96, Succeeding in the World of Work. Write a separate short paper on each of the following words. Tell what the words mean to you and your personality.

    a. Parental pressure, teacher pressure, and peer pressure
    b. Economic resources
    c. Marital status
    d. Chance
    e. Self-concept

6. Submit each of the above papers to your instructor. Discuss them with the instructor.

7. With the help of your instructor and classmates:

    a. Identify the job area for which you are probably best suited.
    b. List areas of your personality and work habits you will need to develop in order to perform your chosen job.
    c. Discuss with your instructor and classmates how these personality factors (traits) and work habits are important in performing the skills of your chosen job.

8. Use the job area or areas you listed in Activity 7a as your "dream" statement.

    a. Discuss your "dream" paper with your instructor. Explore your personal needs and the requirements of the job area you have identified.
    b. Discuss what you can do to fulfill (1) these needs and (2) requirements of the job you would like to have.

9. Take the written test for this task. You may not use references.

Information Sheet B-1

SELF-RATING YOUR PERSONALITY

Rate your own personality according to traits which make up your personality. Use the chart below:

PERSONALITY RATING

Trait	Excellent	Good	Fair	Poor	Very Poor
ATTITUDE					
COURTESY					
DEPENDABILITY					
DESIRE TO SUCCEED					
ENTHUSIASM					
FORESIGHT					
FRIENDLINESS					
HEALTH					
HONESTY					
INITIATIVE					
LOYALTY					
MORALITY					
NEATNESS					
OPEN-MINDEDNESS					
PERSONAL APPEARANCE					
PUNCTUALITY					
SELF CONTROL					
SENSE OF HUMOR					
TACT					
USE OF VOICE					

Student Competency Sheet

Duty B: HUMAN RELATIONS

Task 2: UNDERSTAND SUCCESSFUL WORK ATTITUDES

Performance Checklist

1. Identify personal traits that affect your relationship with others.
2. Analyze how personal traits and attitudes of others affect you.
3. Analyze how your personal traits affect others.
4. Identify and analyze the ways the attitudes of others are influenced by your attitudes, traits and habits.
5. Make a plan to upgrade your attitudes, traits and habits.

Test

Items Needed:
1. Paper
2. Pencil or pen
3. Envelope

Task: Demonstrate your understanding of the principles involved in "successful work attitudes."

Standard:
1. Your instructor will evaluate your role-play performance of positive and negative attitudes. Your performance must show that you understand:
    a. Yourself in a given role.
    b. How your attitude reflects on your relationship with co-workers.
    c. How your attitude reflects on your relationship with your supervisors.
    d. How your attitude reflects on your relationship and effectiveness with customers.
2. On the test for this task, you must answer twelve (12) of the 15 questions correctly.

Learning Activities

1. Read pages 50-61, Succeeding in the World of Work.
    a. List and define new terms.
    b. Discuss these terms and what they mean to you with your classmates.

2. Take the "5-Minute Timed Test on Following Directions." (Your instructor will supply the test.)
    a. Remember the terms "honesty" and "discipline": do not "clue" another student as to the content of this test.

3. Read and complete Information Sheet B-2, "Personality Rating."

   a. Put your completed rating sheet in an envelope and seal the envelope.
   b. Give the envelope to your instructor to keep until you have completed the activities for this task.

4. See and participate in the following units of Job Survival Skills Program:

   a. Unit VI, "You and Your Supervisor"
   b. Unit VII, "You and Your Co-Workers"
   c. Unit VIII, "Successful Job Behavior"

5. Participate in a class discussion on positive and negative attitudes as related to the floriculture worker:

   a. Role-play attitudes which have been identified by the group.
   b. How have the attitudes demonstrated in the role-play situation changed when the actors played the role of a new employee? an elderly person? a handicapped person? an uncooperative co-worker? an impatient supervisor? a customer who looks as though he/she will buy a great deal and a customer who can't decide what to buy?
   c. Your instructor will evaluate your performance.

6. Take the written evaluation for this task. You must answer twelve (12) of the 15 questions correctly.

7. Your instructor will return the envelope which contains your self-rated "Personality Rating."

   a. Review your self-ratings. Rate yourself again. Have the ratings changed?
   b. Discuss with your instructor the ways you can improve your personality traits to be a more effective floriculture worker.

Information Sheet B-2

UNDERSTAND SUCCESSFUL WORK ATTITUDES

You have read about and discussed traits which make up personality and affect your relationships with others. These traits are very important to floriculture workers. Rate your own personality according to the chart below:

PERSONALITY RATING

Trait	Excellent	Good	Fair	Poor	Very Poor
ATTITUDE					
COURTESY					
DEPENDABILITY					
DESIRE TO SUCCEED					
ENTHUSIASM					
FORESIGHT					
FRIENDLINESS					
HEALTH					
HONESTY					
INITIATIVE					
LOYALTY					
MORALITY					
NEATNESS					
OPEN-MINDEDNESS					
PERSONAL APPEARANCE					
PUNCTUALITY					
SELF CONTROL					
SENSE OF HUMOR					
TACT					
USE OF VOICE					

Student Competency Sheet

Duty B: HUMAN RELATIONS

Task 3: USE PRINCIPLES OF HUMAN RELATIONS

Performance Checklist

1. Make a list of things others do or attitudes they have that annoy you or that you find difficult to deal with.
2. Make a list of things you do or attitudes you may have that might annoy others or make others feel you are difficult to deal with.
3. Make a list of things you find pleasant in others.
4. Make a list of things others have found pleasant in you.
5. Review these lists to identify positive things about yourself that can influence others.
6. Analyze how the things you listed in #5 can affect your career goal.

Test

Items Needed:
1. Paper
2. Pen or pencil
3. Partner

Task: Demonstrate your understanding of:
- a. Some of the motivating factors which cause human beings to behave as they do, and
- b. Ways of influencing others to behave as you would like them to behave.

Standard:
1. Your instructor will evaluate your written and performance demonstrations of how well you understand and can cope with factors which motivate the way people behave.
2. Your instructor will evaluate the written test for this task. You must answer twelve (12) of the 15 questions correctly.

Learning Activities

1. Read pages 104-111, Succeeding in the World of Work.
   - a. List and define new terms.
   - b. Discuss these terms and what they mean to you with your classmates.
2. See and participate in the following units of Job Survival Skills Program:

   a. Unit III, "From Which Point of View"
   b. Unit V, "Communication"
   c. Unit XIV, "Summarizing"
   d. Unit XV, "Individual Assessment"

3. Write a paragraph discussing why human relationships are important to your career. Have your instructor evaluate your work.

4. With a fellow student, role-play a situation between a floriculture worker and another employee.

   a. Have your instructor evaluate your behavior during the performance.
   b. Have your classmates discuss their reactions to your performance.

5. Using the same student partner as in Learning Activity 4, describe in writing what message this person's body language conveyed to you during your demonstration.

   a. Discuss your findings with your partner.
   b. Demonstrate several "body language" forms.

6. While you are in class sessions at the school laboratory, your instructor will evaluate your progress. Look at the "Performance Appraisal" example (Information Sheet B-3). Each area of your performance is appraised: skill competence and personal effectiveness (how your actions affect others).

   a. Discuss with your classmates how you can try to achieve skills that will help you earn the best ratings for each item on the form.

7. Take the written evaluation for this task. You must answer twelve (12) of the 15 questions correctly. (You may not use references.)

Information Sheet B-3

PERFORMANCE APPRAISAL
(For Floriculture Students)

Name: ______________________ Date: __________

School: ______________________ Period Covered: __________

TEACHER INSTRUCTIONS: This form may be used to evaluate student performance. It should be reviewed with the student. Place a check in the space which best expresses your judgment.

1.	QUALITY OF WORK	Unsatisfactory ( )	Satisfactory ( )	Above Average ( )
2.	QUANTITY OF WORK	Substandard ( )	Average ( )	High ( )
3.	POTENTIAL	Doubtful ( )	Promising ( )	Above Average ( )
4.	ATTITUDE	Indifferent ( )	Normal Interest ( )	Enthusiastic ( )
5.	COOPERATION WITH OTHERS	Antagonistic ( )	Satisfactory ( )	Supportive ( )
6.	JOB SKILL	Low ( )	Adequate ( )	Good ( )
7.	INITIATIVE	Needs Prodding ( )	Does Assigned Work Well ( )	Seeks Tasks to be done ( )
8.	ATTENDANCE	Unsatisfactory ( )	Satisfactory ( ) — days out of — possible	No. of days Present
9.	APPEARANCE	Must Improve ( )	Satisfactory ( )	Outstanding ( )

COMMENTS ____

____

____

SIGNATURE OF TEACHER ______________________ DATE __________

SIGNATURE OF STUDENT RATED ______________________ DATE __________

DUTY I

PREPARATION OF SOILS AND PLANTING MEDIA

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Collect soil samples
- Analyze soil samples for pH levels
- Analyze soil samples for soluble salts content
- Shred planting media
- Screen planting media
- Mix media materials to improve soil quality
- Sterilize growing media
- Mix fertilizer into planting media
- Pasteurize soil in field areas
- Lime and fertilize fields
- Till, disc, level and smooth planting fields
- Plan and mark location of planting beds
- Shape and form planting beds
- Install bedwire in planting beds

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Student Competency Sheet

Duty 1: PREPARATION OF SOILS AND PLANTING MEDIA

Module A: Soil Analysis

Task 1: TAKE SOIL SAMPLES

Performance Checklist

1. Identify the general area as well as the spot locations on a county soil survey map or grid from which the composite sample is to be collected.
2. Collect soil to a depth of 6 inches from ten (10) or more locations, as identified on the map.
3. Mix the soil taken from all locations together. (Combine it into a single one (1) pint sample.)
4. Air dry the soil sample, crush soil clods, and screen out rocks and debris.
5. Place the sample in a clean plastic bag. Label the sample with care for laboratory testing. Make sure that the area from which it came is identified.
6. Complete the soil test information sheet.
7. Clean and store all tools and equipment used.

Test

Items Needed:
1. Planting bed (or field areas)
2. Spade, soil auger, or soil sampling tube
3. CLEAN container for collecting soil
4. Plastic bags
5. Labels
6. County soil survey map

Task: Take two (2) soil samples (about one (1) pint of soil in each).

Standard:
1. Properly collected and labeled samples must be representative of the area.
2. Samples must be:
   Sample #1 - A composite of soil taken from at least ten (10) different holes.
   Sample #2 - From an area covering only one (1) soil type.

Learning Activities

1. Look at the Soil Structures transparencies (Texas A & M University).

2. Your instructor will:

    a. Assign reading/viewing materials on environmental influences on plant growth.
    b. Discuss crops suitable to the environment and sales potential of your locale. Take notes.
    c. Assign reading/viewing materials on soils prevalent in your locale.
    d. Discuss crops suitable to soils prevalent in your locale. Take notes.

3. Read Information Sheet I-A-1 (the West Virginia University "Field Crop and Grassland Soil Test" sheet).

    a. Discuss each section of the Soil Test sheet with your class.

4. Watch your instructor demonstrate the use of soil sampling equipment.

5. Follow the procedures of the Performance Checklist:

    a. Collect five (5) soil samples from an assigned area, and
    b. Mix all five samples into a single one-pint sample.
    c. Screen the sample; smooth out any clumps.
    d. Label and air dry the sample.
    e. Discuss your sampling technique with your instructor.

6. Compare your soil samples with those of two classmates:

    a. Write the name of the soil type of each of your samples and theirs.
    b. Write a short description of each of the sample soil types.

7. With your class, discuss:

    a. Why soil is collected from the top 6 inches.
    b. Why it is necessary to collect soil from several locations to make a single sample.
    c. Why it is important to use only clean sampling tools and soil containers.

8. Have your instructor evaluate your performance as you collect, mix, dry and bag the following samples:

    a. One (1) pint mixture (composite) of soil taken from at least ten (10) different holes.
    b. One (1) pint from an area of ground which has only one (1) type of soil.

9. Complete a Soil Test sheet (provided by your instructor) for each of the two samples in Learning Activity #8. Have your instructor evaluate your completed Soil Test sheets.

10. Visit a soil testing laboratory:

    a. Observe procedures and equipment.
    b. Write a report of your observations.
    c. Discuss your observations with your class.

11. Obtain soil samples from other sites. Compare them with those in your samples. Discuss any differences.

12. Using screens, classify soil types according to a standard soil triangle.

WEST VIRGINIA UNIVERSITY — SOIL TESTING LABORATORY
MORGANTOWN, 26506

First
Read the instructions
back of this sheet!

Field Crop and Grassland Soil Test *

Avoid delays
Send samples betw
June and Janu

FOR OFFICE USE
County Serial No. ____
W. V. U. Lab. No. ____

ASCS cost sharing? Yes ☐ No ☐

Research sample? Yes ☐ No ☐

CLEARLY PRINT YOUR NAME & ADDRESS IN THIS BOX
(Name)
(Street or Route)
(City) (zip)

Soil sampled in ____ County, W.

Date soil was sampled ____ 19

Sample represents area of roughly ____ ac

Your field number ____

Soil name ____ (Check your farm plan, soil map or SCS offi

Check What Applies
- ☐ bottomland with (good) (fair) (poor) drain
- ☐ river terrace with (good) (fair) (poor) drain
- ☐ (level) (rolling) upland with (good) (fair) (poor) drain
- ☐ (sloping) (steep) upland with (good) (fair) (poor) drain

Percent slope ____ % Main slope faces (North) (East) (South) (W

FIELD CROPS

Kind of crop ____

If corn, grain or silage? ____ No till? ____

Past use and treatment of this field ____

When was this soil last tested? ____ WVU lab. No.? ____

Do you desire a follow up by County Agent? Yes ☐ No ☐

GRASSLAND

☐ hay ☐ established
☐ pasture ☐ new seeding

Kind(s) of grass ____

Kind(s) of legume ____ % legume

Past use and treatment of this field ____

When was this soil last tested? ____ WVU lab. No.? ____

Do you desire a follow up by County Agent? Yes ☐ No ☐

Landowner & Co. Agent

Recommendations to Landowner

Lime ____ tons/acre

Fertilizer see enclosed sheets

Other enclosures

Soil Test Results (Office Use Only)

pH	L.R.		Available major plant nutrients P	K	Ca	Mg	Total CEC & BS	% organic matter	texture class
____	____	lb./acre	____	____	____	____			
		meq/100gr.		____	____	____	____		
		%saturation		____	____	____	____		

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ranges
4.5 extr. acid
4.5-5.0 v. strongly acid
5.1-5.5 strongly acid
5.6-6.0 medium acid

Approximate ranges of plant nutrient availability (lb/acre)

	P	K	Ca	Mg
low	0-25	0-60	0-1000	0-100
medium	25-50	60-120	1000-2500	100-250
high	50-80	120-240	2500-4000	250-500

0-2 low
2-5 medium
5-10 high
over 10 very

IMPORTANT INSTRUCTIONS FOR USING THIS SOIL TEST MAILING KIT

Use a hard lead pencil or ball point pen and PRINT and mark on a hard, smooth surface. Press down hard since you are making 4 copies.

So that you may receive the best recommendation, answer **ALL** the questions that apply to your soil sample.

This soil test mailer is good for having ONE soil sample analyzed for pH, lime requirement, and tests for the available amounts of phosphorus, potassium, calcium and magnesium. It can be mailed by your County Agent if delivered to his office.

Upon request and for an additional fee, tests for other elements can be made. Contact your County Extension Agent for details, or write WVU Soil Testing Lab., 1076 Agricultural Science Bldg., Morgantown 26506. You can make phone inquiries by calling 293-6258 or 293-5240.

TAKE GOOD SOIL SAMPLES

The soil test results will be of little value unless a proper sample is taken. To obtain a good sample, please follow these procedures:

WHEN TO SAMPLE

Soil samples taken in late summer and fall are best because they come closer to representing the true nutrient status in the soil that a growing crop encounters, than those taken in late fall through early spring.

Avoid taking samples when the soil is wet or frozen because of the difficulties encountered in handling and mixing.

Do not take soil samples immediately after applying lime or fertilizer--wait several months, or even longer if dry weather prevails. Just a pinch of fertilizer or lime in a sample would give a very high test reading.

Send samples well in advance of the need for recommendations. Allow about 3 weeks for processing the samples and returning the information to you. Samples sent to the laboratory between January and June may take longer to process. Avoid delays of your results by sending samples between July and December.

WHERE TO SAMPLE

To assess the average fertility which plant roots encounter in a soil adequately, a minimum of 15-20 randomly selected soil borings should comprise the composite sample submitted to the laboratory. If the field is larger than 10 acres or if fertilized heavily in recent years, a minimum of 30 borings should be made.

Take separate samples from areas not characteristic of the field: wet spots, eroded areas, bare spots, back furrows, field edges. DO NOT sample together areas in a field that in the past were limed and fertilized differently or in which organic matter or other soil conditioners have been incorporated, not areas with two or more different soil types. If your field has several different soil types, send a separate sample for each soil. No single sample should preferably represent an area larger than 10 acres.

HOW TO SAMPLE

Using an auger, shovel, or spade, and a CLEAN pail or container, take small uniform cores (or thin slices of soil) from the soil surface to recommended depth (as given in the following paragraph). Gently crush the soil and mix it thoroughly, discarding any roots or stones. Wet soil must be AIR-DRIED on a clean surface before mailing. DO NOT HEAT THE SAMPLE. Send at least ½ pound of the DRY soil to the soil testing laboratory in the special plastic bag which is in the envelope of the soil test mailer and enclose inside the cloth bag. Do not send wet soil as it costs more to mail and will delay your results. Fill out the information sheet completely, including your name and address written legibly.

HOW DEEP TO SAMPLE

Permanent Pastures—Remove organic debris from soil surface, then sample two inches deep.
Meadows—Sample 4 to 6 inches deep after removing organic debris from surface.
Row Crops—Sample the soil to plow depth.

HOW OFTEN TO SAMPLE

Continuous row crops—every 1 to 2 years.
Hay meadows—every 3 years or once each rotation.
Permanent pastures—every 3 to 5 years.

IF YOU READ AND FOLLOW THESE SUGGESTIONS CAREFULLY, YOU WILL BE ON THE WAY TO GOOD SOIL TEST RESULTS. REMEMBER! SOIL TEST RESULTS AND RECOMMENDATIONS ARE NO BETTER THAN YOUR SOIL SAMPLES!

*Format courtesy of West Virginia University - Soil Testing Laboratory, Morgantown, West Virginia 26506

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Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module A: Soil Analysis

Task 2: ANALYZE SOIL SAMPLES TO DETERMINE pH LEVELS

Performance Checklist

1. Review pH meter manual of instructions to determine soil testing procedures.
2. Prepare samples according to instructions for preparing a soil solution.
   a. Measure 25 milliliters of soil in a 100 milliliter beaker.
   b. Add 50 milliliters of distilled water.
   c. Stir the mixture and let stand for 30 minutes, stirring occasionally.
   d. Stir vigorously, just prior to testing.
   e. Insert electrodes of pH meter into prepared sample.
   Caution: Electrodes must be placed in the solution just above the soil, but must not come to rest in the soil.
   f. Record pH of soil sample to nearest tenth.

Test

Items Needed:
1. Three (3) different soil samples
2. Electric pH meter
3. Instruction manual
4. Soil solution containers

Task:
1. Test the soil pH for each of the three (3) samples.
2. Record the readings.

Standard: Readings of the three (3) samples tested must agree ±0.1 pH unit.

Learning Activities

1. Read pp. 29-40, Introductory Horticulture.

2. With your class, discuss when and how to increase or lower pH levels. In the discussion, include the relationship between pH levels and the success of growing plants in your locale.

3. Answer all questions in the Self-Check Test.

4. Compare your answers with the Self-Check Test Answer Sheet. Discuss the answers with your class.

5. Watch a demonstration on the use of the pH meter and litmus-type soil test paper.

6. Watch a demonstration on testing soil samples for pH levels.

7. Obtain a soil sample from your instructor. Prepare the soil sample for pH testing.

8. Practice using the electric pH meter to test the soil sample.

9. Record the pH level of your sample to the nearest tenth pH unit.

10. Take a reading of the practice soil sample with litmus-type soil test paper:

    a. Compare the pH readings of your pH meter with readings from litmus-type soil test papers.
    b. Discuss the advantages and disadvantages of using soil test papers to test pH.

11. Prepare and test three (3) samples for testing:

    a. Test the three samples for pH levels. Record your readings to the nearest tenth pH unit.
    b. Have your instructor evaluate your performance.

12. Investigate the effects of rainfall and native rock materials on the pH of soils in the area where your samples were collected. Discuss your findings with the class.

SELF-CHECK TEST
I-A-2

Analyzing Soil Samples to Determine pH Levels

Answer the following questions:

1. What is pH?

2. Why is pH important?

3. How can you increase the pH of a soil?

4. How can you lower the pH of a soil?

5. Is there an ideal pH for all plants? Why?

ANSWER SHEET
I-A-2

Analyzing Soil Samples to Determine pH Levels

1. pH is a measurement of the acidity (sourness) and alkalinity (sweetness) of the soil.

2. It determines whether the nutrients or plant foods present in the soil can be used by plants.

3. You can increase the pH of a soil by adding lime.

4. One way the pH of a soil can be lowered is by addition of an acid fertilizer such as sulfur.

5. Since different plants, like animals, require different foods, each plant species grows best at the pH which makes its required plant nutrients most available.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module A: Soil Analysis

Task 3: ANALYZE SOIL SAMPLES TO DETERMINE SOLUBLE SALTS CONTENT

Performance Checklist

1. Place a 100-milliliter soil sample in a clean 250-milliliter beaker.
2. Add 200 milliliters of distilled water to the soil sample to make a 2:1 dilution.
3. Stir the mixture, wait 20 minutes and stir again.
4. Place the electrode of a soluble salts soil tester in the soil-water mixture.
5. Read and record soluble salts to nearest one hundredth (0.01).
6. Using the soil tester instruction manual, determine if soluble salts of the soil sample is satisfactory for the crop designated by the instructor.
7. Clean and store all soil test equipment used.

Test

Items Needed:
1. Soil sample
2. Solu-Bridge or equivalent instrument
3. Soluble salts content chart
4. Distilled water
5. 250-milliliter beakers

Task:
1. Prepare required sample mixture.
2. Determine the salt content of the soil sample.

Standard: Readings must vary no more than ±0.1 units from a pre-determined sample tested by the instructor.

Learning Activities

1. Attend a lecture on how the soluble salt content affects plant growth.

2. Discuss with your class the effects of an unbalanced salt content on crops grown in your locale.

3. Watch a demonstration by your instructor on how to:

    a. Prepare a soil sample for salt-content analysis.
    b. Analyze soil for salt content.

4. Obtain two (2) soil samples to test for soluble salts content.

5. Prepare the soil-distilled water mixture for testing.

6. Practice taking a reading:

    a. Insert the soluble salts soil tester into the soil.
    b. Take the readings.
    c. Discuss your readings with the instructor.

7. Have your instructor designate a crop for which you will test soil to see if salt content is correct.

    a. Choose two (2) sites for planting and collect a sample of the soil from each site.
    b. Prepare the samples for testing.
    c. Test the soil samples for soluble salt content.
    d. Record the readings to the nearest tenth pH unit.
    e. Have your instructor evaluate your performance.

8. Based on your test analysis, select a site for planting the designated crop.

    a. Explain your selection to the instructor.
    b. Explain how you could correct any imbalance(s) to accommodate the designated crop in:
        (1) the site you selected.
        (2) the site you did not select.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module B: Media Preparation

Task 1: SHRED PLANTING MEDIA

Performance Checklist

1. Bring materials to proper moisture levels, approximating ten (10) percent of "field capacity."
2. Shovel medium into shredder, controlling the rate to conform to the horsepower and capacity of the machine.
3. Collect medium from the shredder and place in bin.
4. Dispose of plastic bags or other packaging materials.

Test

Items Needed:
1. Soil samples or medium
2. Grinder (or other shredding equipment)
3. Water
4. Shovel
5. Safety glasses and face shield

Task: Shred the plant medium (or other material provided by your instructor).

Standard:
1. Planting medium must be shredded safely, uniformly, and thoroughly.
2. There must be no lumps or unshredded materials.

Learning Activities

1. Your instructor will assign reading/viewing materials related to determining and maintaining moisture levels in growing mediums.

2. With your class, discuss rainfall and moisture-retention properties of soils in your locale. Relate the discussion to crops grown in the area.

3. Investigate and report to your class:

   a. The effects to too much or too little moisture on a crop (as assigned by the instructor).
   b. Methods of correcting moisture levels to bring various growing media to effective levels.
   c. Define and discuss "field capacity."

4. Watch a demonstration on the use of a shredder:

   a. Take notes of key points/procedures.
   b. List and discuss safety procedures for operating the shredder or grinder.

5. List and discuss reasons for uniform shredding of planting media. Include several materials that can be used as planting media.

6. Practice shoveling growth medium into a shredder. (Shovel slowly to avoid overloading the machine.)

7. After shredding a sample planting medium, carefully deposit all shredded material in storage bin. (Avoid spilling or wasting the shredded material.)

8. Clean your work area after shredding.

9. Complete the Self-Check Test on shredding planting media.

10. Compare your answers with the Self-Check Test Answer Sheet. Discuss your answers with the instructor.

11. Ask your instructor for the plant medium or material to be used. Then,

   a. Perform all steps of the Performance Checklist.
   b. Store the materials, as indicated by the instructor.
   c. Clean up the work area.
   d. Discuss your performance with the instructor.

SELF-CHECK TEST
I-B-1

Shred Planting Media

1. Why should the soil or medium be slightly moist before shredding?
2. What is field capacity?
3. What is a medium?
4. Why is growing medium shredded?

ANSWER SHEET
I-B-1

Shred Planting Media

1. The medium should be slightly moist to prevent dust hazard to workers.

2. Field capacity is that moisture content of medium after excess water has been added and all natural drainage has stopped.

3. A growing medium is material in which plants are grown. The medium can be mineral in origin such as soil, perlite or vermiculite or it can be organic such as peat, bark, manure or composted plant material.

4. Growing medium is shredded in order to break up soil clods, grind up plant debris and to make it easier to sift out rocks and debris.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module B: Media Preparation

Task 2: SCREEN PLANTING MEDIA

Performance Checklist

1. Identify the medium to be screened.
2. Place screen over a wheelbarrow, box, or other receptacle.
3. Using shovel, place successive shovelfuls of planting medium on screen, breaking the lumps up with the hands if necessary.
4. Re-screen with smaller screen if necessary.
5. Shake the screen to pulverize medium and to remove trash and all debris.
6. Dispose of debris in container.
7. Clean and store equipment.

Test

Items Needed:
1. Soil medium
2. Shovel
3. Screen with openings small enough to screen out lumps of soil, rocks, or other debris; for example, 1/4 inch hardware cloth
4. Wheelbarrow or box for screened medium
5. Container for debris

Task: Screen the planting medium.

Standard: Medium must be free of all large chunks of soil, (clods), trash, sticks, grass, rocks, plant parts, or other debris.

Learning Activities

1. Your instructor will lecture and/or show pictures on the screening of plant media. Take notes.

2. List:

   a. Several characteristics of a good medium.
   b. The consequences of using a poor medium (include the effects on root spread, top growth, moisture retention, etc.).

3. Discuss with the class: Why is proper moisture content of the medium necessary for screening the medium efficiently?

4. Watch a demonstration on how to screen planting media.

5. Obtain a supply of soil to be screened.

   a. Practice screening your sample.
   b. Set aside the debris caught by the screen; label this as "first screening."
   c. Re-screen the same soil, using a screen with samller openings. Label the debris as "second screening."

6. Place the two collections of debris from the first and second screenings.

   a. Compare the types of materials gathered from each screening. Discuss the findings with your class.
   b. Discuss with your instructor the differences in plant growth that could be expected if you used the first-screened soil rather than the second-screened soil.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module B: Media Preparation

Task 3: MIX MEDIA MATERIALS

Performance Checklist

1. Measure out the specified ratios of ingredients.
2. Put ingredients into a mixing box, if mixing is to be done by hand, or a mechanical mixer.
3. Mix uniformly with a shovel or garden hoe, if mixing by hand.
4. If operating a mechanical mixer, the length of time required for mixing will vary according to type of mixer and other factors, but mixing should continue until no color or textural differences can be observed in the mixed medium.
5. Store the mixed medium into a suitable container.

Test

Items Needed:
1. Mechanical mixer, or mixing box
2. Shovel or garden hoe
3. Materials to be mixed (provided by your instructor)
4. List of mixing ratios (provided by your instructor)

Task:
1. Mix materials according to volume ratios specified by your instructor.
2. Prepare amount of the required medium specified by your instructor.

Standard: Ratios of ingredients must be accurate and be mixed thoroughly.

Learning Activities

1. Read p. 85, Introductory Horticulture.

2. Attend a lecture-demonstration on:

   a. The growth-aiding properties of additives.
   b. The effects of varying the ratios of ingredients.
   c. Recommended ingredient ratios for specific crops.

3. Write answers to the following questions:

   a. What is the germination media for seeds?
   b. How does perlite improve planting media?
   c. What is peat moss?
   d. Why is vermiculite used as a planting medium?

4. Discuss your answers (above) with the class.

5. Watch a demonstration by the instructor on mixing by hand. Take notes.

6. Watch a demonstration by the instructor on using a mechanical mixer. Take notes and list safety precautions.

7. With the class, discuss the importance of thorough mixing.

8. Ask your instructor to designate a ration of ingredients to be mixed.

   a. Gather all the necessary ingredients.
   b. Using a shovel or garden hoe, mix the exact formula.
   c. Using a mechanical mixer, or mixing box, mix the exact formula.

9. Have your instructor evaluate your performance.

10. Discuss the effectiveness of the hand-mixing procedure compared with the effectiveness of using a mechanical mixture. What were the differences in the mixed product? Would there be differences in the growth of the plant?

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module B: Media Preparation

Task 4: STERILIZE (PASTEURIZE) PREPARED MEDIA WITH STEAM

Performance Checklist

1. Check steam applicator to make certain it is working and safe.
2. Place shredded and screened medium in sterilizer and seal with given cover.
3. Turn on steam at low pressure, and hold medium temperature at 180°F for a minimum of 30 minutes.
4. Take readings with probe thermometer to assure that 180°F temperature is constant throughout medium for 30 minutes.
5. Allow medium to cool and stand until workable.
6. Cover medium to avoid contamination.
7. Clean and store all tools and equipment.

Test

Items Needed:
1. Medium to be pasteurized
2. Steam applicator
3. Probe thermometer
4. Bench or pasteurizing bin
5. Vinyl covering

Task: Sterilize (pasteurize) the medium, using the steam method.

Standard:
1. The sterilized medium will be free of plant diseases, live insects, and live weed seeds.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Attend a lecture on:
   a. Plant diseases and their causes.
   b. The uses of sterilized versus unsterilized media.

2. With the class, discuss the consequences of not sterilizing the media, in terms of:
   a. The effects on specific crops grown in your locale.
   b. The effects on crop production (volume and rate).
   c. Profit and loss to the grower.

3. Watch a demonstration of the steam applicator. Take notes of:
   a. Procedures for using.
   b. Safety precautions.

4. Write answers to the following questions:
   a. Why is medium sterilized before growing plants?
   b. Why is a temperature of 180°F necessary for sterilizing media?
   c. What personal safety factors are involved when using the steam applicator?

5. Discuss the answers with the class.

6. With a partner, practice the procedure of sterilizing prepared media with steam:
   a. Obtain a quantity of soil, load the medium into the sterilizer, and steam.
   b. Practice taking readings with the thermometer probe.

7. Perform the procedure for your instructor. Discuss the instructor's evaluation of your performance. (All items on the Performance Check Sheet must be rated acceptable.)

PERFORMANCE CHECK SHEET:

ACTIVITY	Rating	
	ACCEPTABLE	NOT ACCEPTABLE
1. Procedures for steam pasteurization were reviewed.		
2. Tools and equipment were sterilized.		
3. Steam applicator and medium were placed in bin and sealed by means of a vinyl cover.		
4. Medium was brought to 180°F as determined by a thermal probe and held there for 30 minutes before allowing to cool.		
5. Pasteurized medium was stored in a sterile area.		

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module B: Media Preparation

Task 5: MIX FERTILIZERS INTO MEDIA

Performance Checklist

1. Measure out fertilizer and medium according to the ratios and amounts designated by the instructor.
2. Put medium into a large box, wheelbarrow, or other suitable receptacle.
3. Spread fertilizer on top of the medium.
4. Using a garden hoe or shovel, begin at the outer edge and gradually mix the fertilizer into the medium.
5. Clean and store equipment following use.

Test

Items Needed:
1. Medium
2. Granular fertilizer
3. Shovel or hoe
4. Wheelbarrow (or other container)
5. Amount and ratio of fertilizer - medium mix (supplied by your instructor)

Task: Mix fertilizer into medium.

Standard:
1. Fertilizer will be thoroughly mixed into the medium.
2. The chemical analysis of any random samples that could be taken will be approximately the same.
3. Each of the three (3) samples of the mixed media will have the same soluble salts content ± 0.1 unit.

Learning Activities

1. Attend a lecture-demonstration on:
   - a. Organic contents of fertilizer.
   - b. Kinds of fertilizer and their use.
   - c. The effects of different kinds of fertilizer on specific crops.
2. Read the label on two fertilizer packages:
   - a. Read the organic contents of each package.
   - b. Discuss how and why you would use these two fertilizers for specific crops.

3. Watch a demonstration on choosing and mixing fertilizer.

4. Mix fertilizer into a planting medium, as assigned by your instructor.

5. Select three (3) samples from the medium after mixing the fertilizer:

   a. Test each sample for soluble salts content.
   b. Test each sample for pH level.

6. Have your instructor evaluate your performance. Discuss your test samples in terms of:

   a. Uniformity of mix
   b. Salt and pH content
   c. Use of the mixed media for a specific plant crop

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module C: Land Preparation

Task 1: STERILIZE (PASTEURIZE) SOILS

Performance Checklist

1. Service tractor and sterilization equipment to be used.
2. Adjust all elements of tractor and applicator for proper synchronization and coordination.
3. Review safety regulations for chemical use and follow same carefully.
4. Connect gas cylinders to equipment and bring to the required pressure.
5. Regulate gas pressure by adjusting the bypass line so that gas is supplied in excess and then excess is returned to the intake side of the pump.
6. Tighten lines leading to cylinders securely.
7. If the system leaks, turn off cylinders and tighten.
8. Replace leaking gaskets or couplings.
9. Test system for leaks before operating.
10. Operate tractor and sterilization unit so that treatment chemical is fed into the soil evenly and uniformly.
11. Secure plastic covering to soil at all its outer margins.
12. Thoroughly clean tank and all applicator equipment following use and store.

Test

Items Needed:
1. Treatment chemical
2. Infected field
3. Field tractor
4. "Vorlex" pump (or similar sterilization unit)

Task: Sterilize (pasteurize) the soil in a land area designated by your instructor.

Standard:
1. Treatment chemical will be applied in accordance with the prescribed rate, according to the manufacturer's requirements.
2. The soil will test sterile following the application.

Learning Activities

1. Read the chapter on soil sterilizing in The Ball Red Book. Discuss the chapter with the class.

2. Attend a lecture on the use of chemicals in sterilizing soil.

3. Discuss with your class:

   a. How to select a chemical for use in sterilizing soil.
   b. Why a plastic covering is placed over the soil after sterilization chemicals have been applied.
   c. What happens to crops when they are planted too soon in soil that has been recently sterilized.
   d. How to determine when it is safe to plant crops in soil that has been sterilized.

NOTE: IF FIELD EQUIPMENT (tractor and applicator) ARE TO BE USED FOR THIS TASK, your instructor will provide units of instruction on handling and servicing tractors. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, December, 1978.)

4. Watch a demonstration on inspecting and testing a gas cylinder for leaks:

   a. Take notes of all steps of the procedure.
   b. Take notes of all safety precautions.

5. Under the supervision of your instructor, inspect a gas cylinder and test the cylinder for leaks.

6. Watch a demonstration on the repair of a faulty gas cylinder gasket or couplings.

   a. Take notes on all steps of the procedure.
   b. Take notes of all safety precautions.

7. Under the supervision of your instructor, repair a faulty gas cylinder gasket or couplings.

8. Watch a demonstration on attaching sterilization equipment to a tractor:

   a. Take notes on all steps of the procedure.
   b. Take notes of all safety precautions.

9. Under the supervision of your instructor, practice connecting and disconnecting sterilization equipment to a tractor.

10. Watch a demonstration on chemical application to the soil.

    a. Take notes on all steps of the procedure.
    b. Take notes of all safety precautions.

11. Under the supervision of your instructor, operate tractor and sterilization unit.

12. As directed by your instructor, perform the steps of the Performance Checklist. Your instructor will evaluate your performance and then discuss the evaluation with you.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module C: Land Preparation

Task 2: APPLY LIME AND/OR FERTILIZER

Performance Checklist

1. Check out applicator and calibrate the same to make sure the desired quantity of lime carrier will be distributed.
2. Put lime or fertilizer, whichever is to be used, in applicator and spread at the prescribed rate.
3. Disc or otherwise mix the lime or fertilizer into the soil.
4. Flush applicator with water and coat interior with oil when job has been completed and prior to storing to prevent corrosion of the metal parts.

Test

Items Needed:
1. Lime or fertilizer specified by your instructor
2. Area of land for application
3. Lime/fertilizer carrier
4. Lime/fertilizer applicator
5. Water
6. Oil
7. Instructor's directions on the amount of lime/fertilizer to be applied.

Task: Apply the specified rate of lime or fertilizer to the land area.

Standard: Soil tests of the treated soil will show that lime or fertilizer was applied uniformly at the proper rate within 250 pounds of fertilizer or 1,000 pounds of lime per acre.

Learning Activities

1. Read pp. 437-439, Introductory Horticulture.

2. Attend a lecture on the uses of lime and fertilizer in preparing soils.

3. With a small group, discuss the reasons for the application of lime to soils. Make a list of:

   a. Kinds of soil in your locale, by lime content.
   b. Uses of lime for crops grown in your locale.

4. Describe to your class or write the procedure for calculating the amount of lime to raise the pH to the proper number for the optimum growth of plants.

NOTE: IF TRACTOR AND DISC ARE TO BE USED FOR THIS TASK, your instructor will provide necessary instruction on their use and servicing. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, December, 1978.)

5. Watch a demonstration of the operation and cleaning of application equipment.

6. Under the instructor's supervision, practice the following:

   a. Calibrating the applicator for three (3) different settings.
   b. Loading lime or fertilizer into the carrier.

7. Apply lime or fertilizer to an area assigned by your instructor. Have your instructor evaluate your performance.

8. Take three (3) soil samples from the treated area. Test to determine:

   a. If the proper rate was applied.
   b. If the lime/fertilizer was applied evenly.
   c. Discuss the test results with the instructor.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module C: Land Preparation

Task 3: TILL LAND

Performance Checklist

1. Identify the land area to be tilled.
2. Service the tractor and plow.
3. Hook plow to tractor.
4. Adjust the plow to meet the following requirements:
   a. Plow is adjusted to desired depth and share runs parallel to the center line of the tractor.
   b. The landside of the plow is vertical or as nearly vertical as possible.
5. Mark off area to be tilled into "lands" or areas of size which allow for the best economy in the use of fuel and time.
6. Till the land beginning in the middle of the selected land and back furrow towards the opening furrow or center line.
7. Wash mouldboard and plow shares following use and coat them with oil to prevent rust prior to storage.

Test

Items Needed:
1. Area of land to be tilled, as designated by your instructor
2. Farm tractor with 3-point hookup
3. Plow

Task: Till the land.

Standard:
1. Plowing must be uniform depth throughout the field (no less than 4" deep).
2. There must be no skips or unplowed areas.
3. Dead furrows must be left in the field (to make leveling easier).
4. At least 75% of live weeds must be turned under.

Learning Activities

1. Attend a lecture on land preparation as related to:

   a. Soil conservation.
   b. Economical use of space.
   c. Crop rotation.

2. Read materials assigned by your instructor on the topics in Learning Activity #1. Discuss any questions you may have.

3. Write the following:

   a. Define "tilth."
   b. Explain how good tilth is related to the addition of lime and the presence of organic matter in the soil.
   c. Define "puddling."
   d. Explain why working wet clay soils results in puddling.

4. Discuss with the class:

   a. Can tillage harm the soil?
   b. How does puddling affect the tilth of soils?

5. Demonstrate how an agriculturalist determines whether a plot of soil has the proper moisture content to be worked.

NOTE: IF TRACTOR AND PLOW ARE TO BE USED FOR THIS TASK, your instructor will provide instruction on the use and servicing of the tractor and plow. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, December, 1978.)

6. Watch a demonstration on preparing equipment and tilling land.

7. Under the supervision of your instructor, practice hooking and unhooking plow to tractor.

8. Assisted by your instructor, select and mark off land to be tilled. (Your instructor will designate the crop for which you are preparing the land.)

9. Attend a lecture on:

   a. Care of the plow.
   b. Alignment of the plow and share.

10. Under the supervision of your instructor, till the land. Follow all steps in the Performance Checklist. Your instructor will evaluate your performance and discuss it with you.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module C: Land Preparation

Task 4: DISC LAND

Performance Checklist

1. Service the tractor and disc harrow.
2. Connect disc to tractor.
3. Adjust the disc to the proper cutting angle and depth depending upon condition of the land.
4. Store unit under shelter following the coating of the discs with oil.

Test

Items Needed:
1. Tractor
2. Disc harrow
3. Land area to be disced, as assigned by your instructor

Task: Disc the land.

Standard:
1. Discing must be uniform throughout the field.
2. The soil will be 95% free of large clods or clumps of sod or live plants.
3. The soil will be left in a level friable condition.

Learning Activities

1. Attend a lecture-demonstration on the purposes of discing.

2. Discuss with your class the beneficial and harmful effects of discing.

NOTE: IF TRACTOR AND DISC HARROW ARE TO BE USED FOR THIS TASK, your instructor will provide instruction on the use and servicing of the equipment. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, December, 1978.)

3. Watch a demonstration on discing land.

4. Watch a demonstration on connecting a disc harrow to a tractor and adjusting the disc to cutting angles.

5. Under the supervision of your instructor, practice connecting and disconnecting a disc harrow to a tractor.

6. Under the supervision of your instructor, practice adjusting the disc to different cutting angles.

7. Your instructor will assign an area to be disced. Set the disc to a setting specified by the instructor. Disc the area. Have your instructor check your work.

8. After discing, detach the disc harrow. Clean the disc and return it to safe storage.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module C: Land Preparation

Task 5: LEVEL OR SMOOTH FIELDS

Performance Checklist

1. Identify area to be smoothed and leveled.
2. Service tractor and leveling equipment.
3. Drive or otherwise convey tractor and equipment to assigned area.
4. Adjust the leveling equipment to the following standards:
    a. The leveler pulls evenly and trails directly behind the tractor.
    b. The cutting edge is level.
    c. The set of the blade is low enough to remove the high areas but not too low as to cause a pile up of dirt in front of the blade or cutting mechanism.
5. Work the field in one direction over its entirety.
6. Work the field again at right angles to the direction of the first leveling if necessary to get it sufficiently level and smooth.
7. Store equipment.

Test

Items Needed: 1. Area of land, assigned by your instructor
2. Tractor
3. Land leveler

Task: Level and smooth the field.

Standard: 1. The field will be 95% free of clods larger than one (1) inch diameter.
2. The field will be sufficiently smooth and level for planting direct-seeded crops.

Learning Activities

1. Attend a lecture on the reasons for smoothing and leveling a field before planting. Take notes.

2. Read any materials assigned by your instructor and take notes, and take notes of any films or slides on smoothing and leveling fields.

3. Write the answers to these questions:

    a. Why is it important to remove clods from fields before planting?
    b. What happens to seeds planted on too steep a slope? How can seed loss be prevented?

   c. What happens when the cutting edge of the land leveler is set too low?
   d. What happens to seeds planted in potholes in the fields?
   e. Do some crops not require leveling and smoothing before planting?

4. Watch a demonstration on the use of a land leveler.

   a. Take notes.
   b. Take notes of safety precautions.

NOTE: IF TRACTOR AND LEVELER ARE TO BE USED FOR THIS TASK, your instructor will provide instruction on the use and servicing of the tractor and leveler. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, December, 1978.)

5. Under the supervision of your instructor, practice adjusting leveling equipment.

6. Under the supervision of your instructor, practice smoothing an area assigned by the instructor.

7. Perform the procedure in the Performance Checklist. Your instructor will evaluate your work. Discuss the evaluation with the instructor.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module D: Developing Beds

Task 1: MARK OFF LOCATION OF BEDS

Performance Checklist

1. Determine the size and extent of the area to be marked off.
2. Identify the crop to be grown and the wheel base and size of the equipment to be used.
3. Plan the width and layout of the beds according to the size of the equipment and plants to be grown.
4. Beginning in one corner of the shadehouse or field area, mark off beds according to the predetermined plan.
    a. Drive stakes at all four corners of the bed.
    b. Measure the width of the alleys between beds and mark them with stakes.
    c. Stretch string from corners of each bed to mark off beds and indicate alley ways, setting additional intermediate or "in between" stakes for alignment and support if required.
5. Return unused stakes and other materials to storage.

Test

Items Needed:
1. Steel tape
2. Stakes
3. String or wire
4. Area in a shadehouse or in the open field where a floral crop is to be grown.
5. Instructions regarding:
    a. Crop to be grown
    b. Length and width of beds

Task:
1. Mark off the area for the location of beds.
2. Allow space for aisles or paths.

Standard:
1. Beds must be 36 or 42 inches wide; there must be ample space for optimum plant growth.
2. Beds must be easily accessible for both equipment and personnel.

Learning Activities

1. Attend a lecture on sizing beds for crop growth and accessibility.

2. Read or view materials which illustrate how to locate and mark off beds for several crops grown in your locale. Discuss this information with your class.

3. Visit planted areas and discuss, for each crop:

   a. Width and location of the beds.
   b. How much space is needed for equipment and for people to tend the crop.
   c. How much space is allowed for crop growth.

4. Your instructor will assign a crop:

   a. Draw a scaled sketch of one seedling of that crop.
   b. Draw a scaled sketch of the full-grown plant (to maximum root and top growth/spread).
   c. Compare your drawings with actual plants.

5. Watch a demonstration on measuring and marking beds. Note safety precautions.

6. Demonstrate the use of a steel tape for measuring bed size and alley width.

7. Select a crop to be planted in a shadehouse or field.

   a. Plan the quantity to be grown. Write the plan.
   b. Plan the space to be used (size and location). Draw a sketch.

8. Have your instructor review your drawings and written plans, which must include:

   a. Measurement of the wheel base of equipment to be used (to allow enough space between rows).
   b. Space to be used for your planting (calculated from the number and type of plants to be grown).

   IF YOUR INSTRUCTOR'S CALCULATIONS DIFFER FROM YOURS, CHECK:

   (1) Measurements
   (2) Addition, subtraction, multiplication, division
   (3) Ask your instructor for practice problems in measuring and calculating.

9. Select an outdoor site for planting (based on such factors as slope, exposure, and drainage):

   a. Sketch the plan.
   b. Mark off planting bed according to your plan.
   c. Have your instructor evaluate your performance.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module D: Developing Beds

Task 2: SHAPE OR FORM BEDS

Performance Checklist

1. Determine shape of bed.
2. Service tractor and bed press.
3. Adjust equipment to meet crop requirements.
4. Make a trial run to check bed press setting.
5. Shape or form beds.
6. Clean equipment and store following use.

Test

Items needed:
1. Planting area already prepared for raising a specified floral crop.
2. Tractor
3. Bed press

Task: Shape and form the bed.

Standard:
1. The center of the bed must be approximately 2-1/2 inches higher than the sides.
2. The sides of the bed must be 3 to 5 inches higher than the walkways.

Learning Activities

1. Attend a lecture on the factors which help in determining the shape of a bed. Take notes.

    a. Have your instructor assign a plot for a specific crop.
    b. Draw a sketch of the bed shape.
    c. Write a plan for shaping the bed.
    d. Discuss why the sides of the bed should be 3 to 5 inches higher than the walkways.

NOTE: IF TRACTOR AND BED PRESS ARE TO BE USED FOR THIS TASK, your instructor will provide necessary instruction on their use and servicing. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, December, 1978.)

2. Watch a demonstration on how to attach a bed press to a tractor. Take notes on safety precautions.

3. Under the instructor's supervision and with a partner, practice connecting and disconnecting a bed press to a tractor.

4. Watch a demonstration on adjusting the setting of the bed press. Take notes on safety precautions.

5. Under the instructor's supervision and with a partner, practice adjusting the bed press to several different settings.

6. Watch a demonstration on using the equipment to shape and form a bed. Take notes on safety precautions.

7. Under the instructor's supervision, operate the tractor and shape and form a bedding area assigned by your instructor. Observe all safety rules for operating the equipment.

8. Discuss your work with your instructor.

Student Competency Sheet

Duty I: PREPARATION OF SOILS AND PLANTING MEDIA

Module D: Developing beds

Task 3: MARK OFF PLANTING SPACES WITH BEDWIRE

Performance Checklist

1. Set posts at corners of the bed.
2. Roll out bedwire to be used.
3. Stretch bedwire over bed and tie firmly to posts with string or wire on both ends of the bed.
4. Set stakes firmly at 10 feet intervals and at uniform height along both sides of the planting bed.
5. Affix wire to support stakes on both sides of the bed at ground level.
6. Return any extra stakes, wire or other unused items to storage.

Test

Items Needed:
1. Bed to be planted
2. Bedwire
3. Posts
4. Stakes
5. Mallet or post driver
6. String or wire
7. Wire cutters

Task: Mark off planting spaces with the bedwire.

Standard:
1. Bedwire must be stretched and secured to posts at all four corners of the bed.
2. Bedwire must be secured at the height above the bed (as designated by your instructor).
3. Stakes must be driven into the ground in both sides of the bedwire to endure the entire growing season.

Learning Activities

1. Attend a lecture-discussion on the uses of bedwire. Then:
    a. Visit a planted area where bedwire was used for a specific crop, such as poms. If possible, also visit a planted area where bedwire was not used for the same crop.
    b. Write your observations. Include observations on the effects to plant growth when bedwire was used and the effects when it was not used.
    c. Discuss your observations with the class. What are other advantages of using bedwire?

2. Watch a demonstration on how to install bedwire. Take notes on safety precautions.

3. With a partner, install bedwire in an area which is to be planted. Have your instructor check your work.

NOTE: 1. If crop planting is to follow this activity:
Plants will be set by using the four corners of the bedwire square as the frame for each plant.
2. If the planting season has ended, remove the bedwire. Store wire and stakes, as directed by the instructor.

DUTY II

PROPAGATION AND PLANTING OF PLANTS

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Regulate temperature in cold storage units
- Regulate time intervals for automatic mist propagation systems
- Plant bulbs
- Plant seeds
- Transplant seedlings
- Take cuttings
- Stick cuttings in growth medium
- Remove and transplant rooted cuttings for transplanting
- Label plants or cuttings

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module A: Environmental Mechanisms

Task 1: REGULATE TEMPERATURE OF COLD STORAGE UNIT

Performance Checklist

1. Operate unit to make sure it is working.
2. Calibrate thermostat with thermometer.
   a. Check thermostat reading with temperature reading on the thermometer.
   b. Adjust the thermostat.
3. Set controls to temperature specified.
4. Using maximum - minimum thermometer, operate system and make necessary adjustments to insure desired temperature.

Test

Items Needed:
1. Cold storage unit with thermostatic controls
2. Your instructor will tell you the temperature setting
3. Maximum-minimum thermometer
4. Regular thermometer

Task: Set the thermostat to maintain the specified temperature at which the cold storage unit is to be operated.

Standard: Temperature in the unit must not vary ±2° from the desired temperature.

Learning Activities

1. Read pp. 30-32, Greenhouse Crop Production.

2. Discuss the consequences of improper setting of the storage unit temperature.

   a. If too low, what happens to stored flowers and foliage?
   b. If too high, what happens to stored flowers and foliage?

3. Using the cold storage unit in your laboratory (stocked with flowers and foliage):

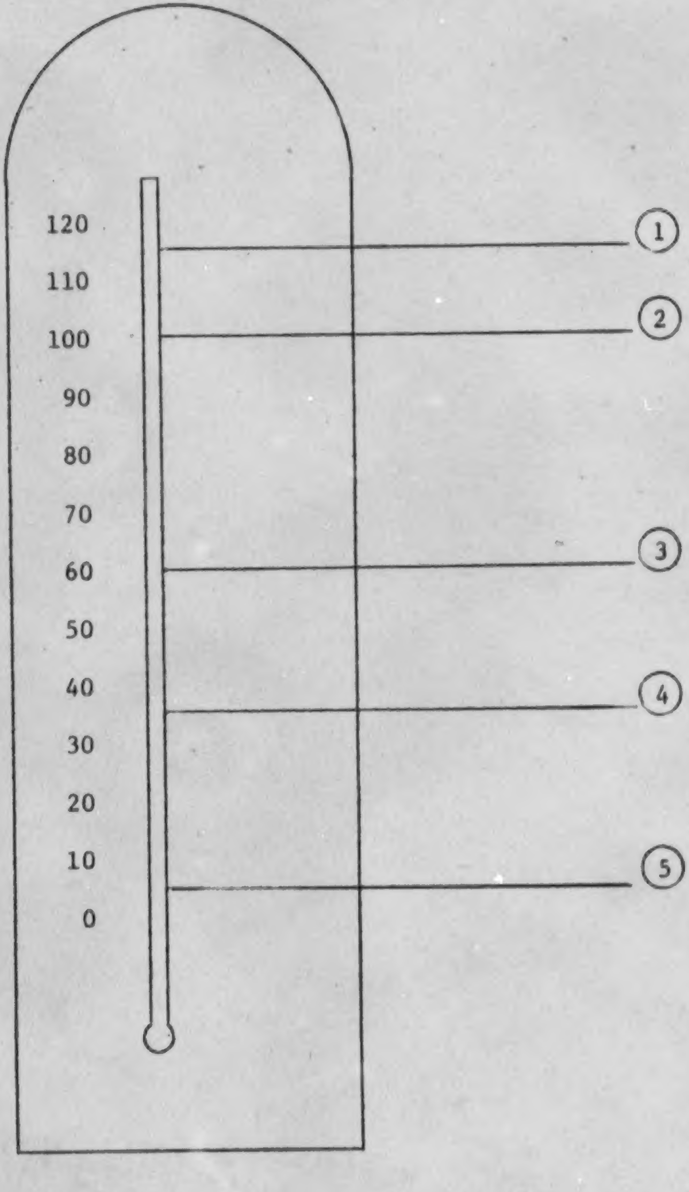
   a. Calculate the replacement costs for ruined flowers/foliage.
   b. Calculate the profit loss caused by ruined flowers/foliage.

4. Demonstrate ability to read a thermometer by completing Self-Check Test II-A-1.

5. Adjust a thermostat to a specified temperature.

SELF-CHECK TEST
II-A-1

What is the Temperature?


120
110
100
90
80
70
60
50
40
30
20
10
0
①
②
③
④
⑤

ANSWERS: 1. 115° 2. 100° 3. 60° 4. 35° 5. 5°

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module A: Environmental Mechanisms

Task 2: SET TIME CLOCKS FOR AUTOMATIC MIST PROPAGATION SYSTEM

Performance Checklist

1. Identify the five desired time settings.
2. Locate the time clocks.
3. Move the "on" indicator on the 24-hours clock to the time desired for starting the misting cycles. Move the "off" indicator to the time when the misting is to stop.
4. Set trippers on the short-interval time clock to obtain the intervals-desired misting schedule.
5. Check the system with a watch, making adjustments in the settings as required.

Test

Items Needed:
1. Mist propagation system
2. Five (5) different time interval settings for time clocks (specified by your instructor)
3. Watch

Task: Set the time clocks to activate the mist propagation system in accordance with the times specified by your instructor.

Standard: The system must automatically turn on and off with no more than a 10 percent variation from the prescribed time intervals.

Learning Activities

1. Read pp. 314-319, Plant Propagation Principles and Practices.

2. Observe an automatic mist system in operation. Note and discuss:

   a. Interval at which mist system is turning on and off.
   b. Why system is operated at intervals rather than continuously.
   c. Consequences of improper interval settings.

3. Discuss the factors which determine the misting intervals for several different plant crops.

4. Write the time clock intervals for several types of plants, as assigned by your instructor.

5. Identify parts of a mist system, using p. 120, Flower and Plant Production in the Greenhouse. (Point out the parts to your instructor.)

6. Attend a lecture-discussion on detection and repair of a faulty system.

7. Watch a demonstration on setting a time clock.

8. Set mist propagation system for five (5) different time intervals, as specified by your instructor. Make necessary adjustments. Have your instructor check the settings.

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module B: Seeds and Bulbs

Task 1: PLANT BULBS

Performance Checklist

1. Identify field area selected for planting.
2. Use string and stakes to mark off spacings for rows.
3. Using a hoe or other preferred tool, cut furrow for planting the bulbs.
4. Place bulbs upright in furrow at spacing intervals and depth specified by the bulb grower.
5. Use garden hoe to cover the bulbs with soil and tamp lightly with blade of the hoe to firm the seedbed.
6. Clean tools and return them to storage.

Test

Items Needed:
1. Prepared field area
2. Treated bulbs
3. Stakes
4. String
5. Garden hoe (or similar tool)
6. Planting instructions
7. Steel rule

Task: Plant the bulbs.

Standard:
1. Bulbs will be planted in straight lines.
2. Bulbs will be spaced five (5) to six (6) inches apart, or as required for crop.
3. Bulbs will be firmly covered with soil to prescribed depth.

Learning Activities

1. Read pp. 366-374, Introductory Horticulture. Answer all questions in the self-evaluation on pp. 373-74.

2. Write to a bulb grower, requesting the latest catalog. Study the grower's instructions for planting bulbs.

3. With a partner, study a tulip bulb:

   a. Cut bulb open and observe outer layers, inner layers, and heart.
   b. Draw the bulb section:
      (1) Identify the layers which will grow into leaves.
      (2) Identify the heart from which the flower bud will grow. (This is protected by several fleshy-leaf layers.)
   c. Discuss the function of the leaf layers.

4. Attend lecture on crop rotation. Take notes. Discuss:
    a. Why crops are rotated.
    b. Record-keeping procedures.
    c. How to establish and maintain a bedding schedule.

5. Refer to a rotation/bedding schedule provided by your instructor:
    a. Select planting site for an assigned crop.
    b. Discuss the site you selected with the class and instructor. (Include soil, drainage, exposure.)

6. Watch a demonstration on planting bulbs.

7. Discuss row alignment and bulb position for several different crops.

8. Prepare for planting:
    a. With a partner, mark off rows for planting a crop assigned by your instructor.
    b. Dig furrow(s) to prescribed depth for crop.
    c. Work soil for required consistency.
    d. Have your instructor check your work.

9. Plant bulbs:
    a. Place bulbs in furrow, under your instructor's supervision.
    b. Cover and tamp bulbs, according to instructions for type of bulb.
    c. Have your instructor check your work.
    d. Complete the clean-up procedure.

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module B: Seeds and Bulbs

Task 2: PLANT SEEDS

Performance Checklist

1. Identify the seeds to be planted.
2. Fill the containers with germination medium to the top.
3. Place the seeds in flats or containers as provided.
4. Use flour sieve to shake media over seeds to cover them.
   Caution: Do not cover seeds too deeply. Depth of covering will depend on size of seed, but in no case should it exceed 1/2 - 1 inch of firm, evenly distributed media.
5. Correctly label all containers or flats.
6. Place flats in suitable area to germinate.
   Caution: A moist, well lighted area of suitable temperature is generally best for germination, but some species have special requirements.
7. Keep medium in flats moist until seeds have germinated.
   Caution: Mist system is preferable to hand watering.
8. Return unused materials to proper storage.
9. Clean the work area after use.

Test

Items Needed:
1. Flower seeds
2. Flats or containers
3. Growing medium
4. Flour sieve
5. Labeling materials
6. Mist system
7. Propagation heating mat

Task: Plant the seeds.

Standard: Seeds must be spaced and covered in accordance with the requirements for the species of seeds planted.

Learning Activities

1. Read pp. 107-112, Flower and Plant Production in the Greenhouse.

2. Identify ten (10) different kinds of flower seeds (Your instructor will provide the seeds).

3. Cut open several different kinds of seeds.

   a. Draw and name the parts of the seeds.
   b. List the growing conditions best suited to the seed according to its structure.
   c. Discuss your findings with the class.

4. Write answers to the following and then discuss:

   a. Why some seeds take longer to germinate than others.
   b. Whether Easter lillies can be grown from seeds.
   c. When the seeds used in Learning Activity 2 should be planted so the plants will be ready for your market.

5. Perform a seed germination test (Information Sheet II-B-2).

6. Attend a lecture-discussion on where/how to obtain seeds.

   a. Discuss the economics of buying seeds versus providing your own.
   b. Discuss the appropriate time to purchase or collect seeds.

7. Identify a sterile germination medium. With your class, discuss the selection of a proper medium for the ten (10) different kinds of seeds used in Learning Activity 2.

8. Watch a demonstration on flat (or container) preparation.

9. Fill flats or containers with moist medium to depth prescribed for seeds specified by your instructor.

10. Watch a demonstration on placement of seeds.

11. Plant coleus, gloxinia, or impatiens seeds (or seeds specified by the instructor).

12. Discuss labeling. What seems to be the most effective/efficient methods?

13. Prepare labels for your crop.

14. Select site and set flats or containers for germination.

    a. Place on bottom heat.
    b. Mist flats until medium is wet.
    c. Have your instructor check your work.
    d. Clean up the work area.

15. Visit several greenhouses:

    a. Find out where seeds are obtained.
    b. Find out how the grower determines kind and amount to be planted.
    c. Observe seed flat preparation, planting, and labeling procedures.
    d. Discuss variations in the observed procedures.

Information Sheet II-B-2

Seed Germination Test

1. Obtain 100 seeds from the instructor.
2. Place on a wet paper blotter in a warm area.
3. Cover with a wet paper towel.
4. Keep moist.
5. Allow sufficient time for germination.
6. Count number of seeds that germinate.
7. This is the percent of germination for that group of seeds.

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module B: Seeds and Bulbs

Task 3: TRANSPLANT SEEDLINGS

Performance Checklist

1. Identify the seedlings to be transplanted.
2. Fill the sterile containers with medium.
3. Using the thumb, forefinger or stick, make holes in the medium into which the seedlings are to be transplanted.
4. Transplant the seedlings, making sure that there is good contact between the roots and stems with the planting medium.
   Caution: Seedlings should not be transplanted at too great a depth. They should be placed at the same depth they were growing in before being transplanted. Do not bruise the stem or the seedling may die.

Test

Items Needed:
1. Seedlings
2. Growing medium
3. Sterile containers
4. Mist system
5. Labeling materials
6. Watering can or hose

Task: Transplant the seedlings.

Standard:
1. Seedlings must be handled with care and transplanted in the sterile containers.
2. The survival rate will be at least 98 percent.

Learning Activities

1. Read pp. 232-35, Flower and Plant Production in the Greenhouse.

2. Using ten (10) different kinds of seedlings:

   a. Identify each by botanical name and common name.
   b. Draw a sketch of each seedling (stem, leaf, flower). Label the part.

3. Watch a lecture-demonstration on sterilizing containers. Take notes on safety precautions.

4. Sterilize the containers you will need for transplanting seedlings.

5. Watch a demonstration on transplanting seedlings.

6. Select and moisten a sterile growing medium. Transplant a group of seedlings
    a. Make holes approximately 2" apart in sterile containers.
    b. Remove seedlings carefully from seed germination flats.
    c. Place seedlings in holes at same depth they were originally grown in. Firm the medium around the seedling.
    d. Label transplanted seedlings with date, variety, and name.
    e. Have your instructor evaluate your work.
    f. Clean work area.
7. Observe greenhouse workers. Take notes and, later, discuss:
    a. Variations in procedures (spacing, depth of planting; medium, moisture, and other growing conditions; tools and equipment used).
    b. Speed versus careful procedures.

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module C: Cuttings

Task 1: TAKE CUTTINGS

Performance Checklist

1. Select healthy vigorous plants from which the cuttings are to be taken.
2. Use small pair of shears or a sharp knife, if preferred, and collect cuttings in a suitable container.
   Caution: Do not take cuttings from diseased, unhealthy, or new wood stock. Be very careful not to damage the cuttings. Also, cuttings should be dampened, placed in cooler, depending on species, and then shipped or planted as soon as possible.
3. Clean and return all equipment to storage.

Test

Items Needed:
1. Pruning shears
2. Knife
3. Container
4. Plants from which cuttings are to be taken
5. Sterile rooting medium
6. Labels
7. Waterproof marking pen
8. Cooler or cold storage unit

Task: Take cuttings.

Standard:
1. Cuttings will be 3 to 5 inches in length, depending on kind of plant.
2. Cuttings will be free from disease and broken stems and undamaged.

Learning Activities

1. Read pp. 112-123, Flower and Plant Production in the Greenhouse.

2. Watch the filmstrip: Propagating Ornamental Plants (Vocational Education Products, California State Polytechnic College).

3. Which plants grown in your locale are propagated from cuttings?

   a. Investigate and make a list of your findings.
   b. Discuss the economics and other advantages with your class.
   c. Discuss the growing time(s). (Consider your market.)

4. Visit a nearby nursery for a demonstration of cutting techniques. Discuss your observations with the class.

5. Answer these questions; then discuss:

   a. Whether chrysanthemums grow from cuttings made from tips of shoots that are removed when plants are pinched back.
   b. The best material in which to root cuttings.
   c. Why professional growers use root stimulants on cuttings. What stimulants are used? How are they applied?

6. Watch your instructor demonstrate the proper method for taking cuttings. Note safety precautions.

7. Take cuttings for six (6) new poinsettia plantings in your school's greenhouse.

   a. Prepare the cuttings for storage/shipment or planting, as directed by your instructor.
   b. Have your instructor evaluate your work.
   c. Clean the work area.

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module C: Cuttings

Task 2: STICK CUTTINGS

Performance Checklist

1. Treat cuttings with a fungicidal dip by emersing the cut end into the dip.
2. Spacing the cuttings according to type requirements, insert cuttings into medium at a depth of approximately one (1) inch.
3. Firm up the medium around each cutting to insure good contact with the soil.
4. Irrigate cuttings immediately after planting.
5. Clean up the area and return all equipment and materials to proper place.

Test

Items Needed:
1. 100 fresh tip cuttings
2. Fungicidal dip
3. Rooting aids
4. Prepared rooting beds or pots containing a rooting medium (vermiculite, perlite, or coarse sand)
5. Labeling materials

Task: Stick the cuttings into the medium.

Standard:
1. Cutting will be treated.
2. Cuttings will be inserted into the medium at a minimum depth of one (1) inch.
3. The cuttings will be inserted so there is firm medium around each cutting.

Learning Activities

1. Read pp. 305-310, Plant Propagation Principles and Practices.

2. Attend a lecture-discussion on how to prepare, stick and care for cuttings.

3. With a partner:

   a. Discuss and prepare fungicidal dip and/or root stimulant. Dip cuttings, as assigned by your instructor.
   b. Investigate and prepare rooting beds or pots for the plants assigned by your instructor.

4. Start a new ivy or begonia plant:

   a. Cut off a stem end four (4) or five (5) inches long.
   b. Remove bottom leaves to allow you to insert cuttings into two (2) inches of rooting medium.
   c. Place cutting in coarse sand, vermiculite, or perlite. Keep moist.
   d. In a few weeks, check to see if roots have grown big enough to transfer cutting to standard potting mixture.

5. Start a new geranium plant:

   a. Take three (3) cuttings three to five (3-5) inches long. (Cut just below where leaf is attached to main stem.) Avoid selecting soft, immature, or old and woody branches.
   b. Gently trim lower leaves from cuttings to allow for two (2) inch planting depth.
   c. Dip stem end of cuttings in rooting stimulant.
   d. Set cuttings in vermiculite, perlite, or coarse sand.
   e. Keep cuttings moist without soaking.
   f. Place cuttings in a light but not sunny location until roots begin to form.
   g. Move cuttings into sun when roots have formed. Cuttings are ready to pot with four (4) to six (6) weeks, when roots are about two (2) inches long.

6. Start a new African Violet plant from leaf cutting. Plant three (3) leaf cuttings in vermiculite, perlite, or coarse sand.

7. For an experiment, take two (2) more African Violet leaf cuttings:

   a. Fill a small jar with water and cover top of jar with foil.
   b. Punch two holes in top of foil; insert leaf cuttings.
   c. Wait two (2) to four (4) weeks.
   d. Compare water-produced roots in jar with those developed in vermiculite or sand.
   e. With your class, discuss the strength of the root systems: water-grown versus vermiculite/sand-grown.

8. Calculate your rooting percentage: divide the number of cuttings which actually rooted by the number of cuttings originally taken. (If three of four cuttings rooted, your rooting percentage would be 3/4, or 75%.)

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module C: Cuttings

Task 3: REMOVE ROOTED CUTTINGS

Performance Checklist

1. Remove cuttings without damaging them by inserting the hand under the rooted cuttings and lifting them out of the bed or flat in which they have been rooted.
2. Place cuttings in container large enough to prevent damage to the plant and in which the cuttings can be kept moist.
3. Store cuttings at appropriate temperature.
4. Clean work area.

Test

Items Needed:
1. Rooted bed or flat filled with rooted tip cuttings
2. Container
3. Labeling materials
4. Cooler or cold storage unit
5. Trowel

Task: Remove the rooted cuttings by hand so that they can be transplanted.

Standard:
1. There will be no unnecessary damage to the roots or to the foliage.
2. The roots of the cutting will not be stripped of all their original rooting medium.

Learning Activities

1. Read pp. 105-107, Introductory Horticulture. Study Figure 10-11C (p. 107).

2. Watch a demonstration on how to test and remove rooted cuttings.

3. Remove a rooted cutting and observe the root structure.

4. Ask a partner to remove a rooted cutting from another type of plant.

   a. Compare root structures of the two cuttings.
   b. Discuss length of time required to root each cutting.

5. Test five (5) rooted cuttings by gently pulling on the cuttings to see if root system is developed enough to permit removal of the cutting from its medium for transplanting.

6. Experiment:

   a. Plant a prematurely-removed or damaged rooted cutting next to a healthy rooted cutting.
   b. Label the plants accordingly.
   c. Check the progress of both at regular intervals.
   d. Record your observations.

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module C: Cuttings

Task 4: TRANSPLANT CUTTINGS

Performance Checklist

1. Identify the cuttings to be transplanted.
2. Fill the sterile containers with medium.
3. Using the thumb, forefinger or stick, make holes in the medium into which the cuttings are to be transplanted.
4. Transplant the cuttings, making sure that there is good contact between the roots and stems with the planting medium.
   Caution: Cuttings should not be transplanted at too great a depth. They should be placed at the same depth they were growing initially. Avoid tearing or bruising roots of cutting.
5. Label the container of transplanted cuttings.
6. Water transplanted cuttings evenly and thoroughly.

Test

Items Needed:
1. Cuttings
2. Growing medium
3. Sterile containers
4. Labels
5. Watering can or hose

Task: Transplant the cuttings.

Standard:
1. Cuttings must be handled with care and transplanted in the sterile containers.
2. The survival rate will be at least 98 percent.

Learning Activities

1. Read pp. 159-166, Introductory Horticulture.

2. Watch a demonstration on transplanting cuttings.

3. Select five (5) rooted poinsettia cuttings and transplant into growing medium.

4. Select five (5) rooted chrysanthemum cuttings and transplant into growing medium.

5. As cuttings mature, calculate survival rate by counting number of cuttings that are still developing from the original cuttings transplanted. If seven of the original ten (10) cuttings survived, your survival rate would be 70%.

6. With a small group of students, discuss the best time of year to take field cuttings.

7. With a partner, work out a propagation schedule for crops in the school nursery.

8. Contact a nearby university for any open house activities available at their College of Agriculture. Ask for a copy of the activity schedule. When the schedule arrives, plan a field trip with the help of your instructor.

Student Competency Sheet

Duty II: PROPAGATION AND PLANTING OF PLANTS

Module C: Cuttings

Task 5: LABEL PLANTS OR CUTTINGS

Performance Checklist

1. Print or type labels legibly, indicating the relevant information for a particular species.
2. Follow a systematic procedure. Insert each label so that the plants it represents are in back of and to the right of the label.
3. Double check all labels to assure correct placement on benches.

Test

Items Needed:
1. Cuttings or plants in flats
2. Labels
3. Water-proof marking pen or typewriter

Task: Label the plants or cuttings.

Standard:
1. Writing on all labels must be clean and legible.
2. Labels must be arranged so that the plants are in back of and to the right of the labels.

Learning Activities

1. Obtain ten (10) plants or cuttings to be labeled from your instructor.

2. With a partner, identify each plant or cutting.

3. Print or type on the label: the date, name, and variety of plant or cutting.

4. Place each printed label in flat or container. Avoid damaging plant's roots.

5. Arrange plants on assigned benches.

6. Clean work area and replace all equipment.

DUTY III

CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Terminal Objectives

- Install shade cloth
- Apply shading compound to control light intensity
- Regulate photoperiod and light intensity for plants
- Regulate time clocks in greenhouse
- Adjust and control greenhouse temperatures
- Set out field heaters
- Repair or replace broken pipes, sprinkler heads, mist heads and/or valves
- Force bulbs for scheduled bloom
- Raise or elevate bedwire
- Apply growth regulating chemicals and fertilizers
- Use an automatic irrigation system to apply liquid fertilizer
- Locate malfunctions in fertilizer injection system
- Cultivate and aerate soil
- Schedule crop and equipment care
- Stake and tie plants
- Pinch and disbud flowering plants
- Prune plants

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 1: INSTALL SHADE CLOTH

Performance Checklist

1. Identify shadehouse or other area to be covered and purpose of installation.
2. Check support wires and framework of superstructure over which shade cloth is to be installed to make sure all is in readiness.
3. Select best method to use in installation process - whether by pig rings, grommets or other means.
4. Calculate specific measurement of the area.
5. Allowing for necessary overlap, cut required length or lengths of shadecloth from roll or bolt to meet requirements.
6. Install shade cloth: follow recommended procedures for method determined to be most satisfactory.
7. Clean tools and equipment used. Return all items to their proper place when task has been completed.

Test

Items Needed:
1. Shadehouse where shade cloth needs to be installed
2. Shade cloth
3. Pig rings, grommets, or other holders
4. Cutting tools
5. Measuring device

Task: Install a shade cloth.

Standard:
1. The shade cloth must be firmly fastened to the frame of the superstructure.
2. The shade cloth must be smooth and neat in appearance.
3. The shade cloth must meet the purposes for which it was installed.

Learning Activities

1. Attend a lecture-discussion on the uses of shadehouses:
   a. Crops for which it is used.
   b. Construction and positioning of shade cloth.

2. Write the answers to these questions; discuss your answers:

   a. Why is shade cloth used in a greenhouse?
   b. What types of plants need shade most of the year?
   c. What types of plants prefer sun but still require shading at the hottest time of the year?
   d. What effect does shade cloth have on the temperature inside the greenhouse?

3. Watch a demonstration on how to install shade cloth.

4. Measure an area assigned by your instructor for shade cloth installation.

5. Measure and cut the required amount of shading material.

6. With a partner, install shade cloth in assigned area. Have your instructor check your work.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 2: APPLY SHADING COMPOUND OR PAINT TO GREENHOUSE GLASS

Performance Checklist

1. Check spray apparatus to make sure it is operational.
2. Determine foot candle light requirements and apply compound as required to obtain the desired foot candle reading.
3. Apply compound evenly and avoid overcoating.
4. Apply an additional coat of compound or paint, if necessary.
5. Clean spray gun and other equipment used and return to storage.

Test

Items Needed:
1. A foot candle power requirement, as specified by your instructor
2. Light meter
3. Sprayer
4. Greenhouse on which shading compound is to be applied to the greenhouse glass
5. Shading compound

Task: Apply the shading compound to obtain the desired light intensity.

Standard: Successive coats of shading compound are to be applied uniformly to obtain the required foot candle reading ±10 percent on a clear day.

Learning Activities

1. Read pp. 38-40, Greenhouse--Place of Magic.

2. Attend a lecture-discussion comparing the uses of shade cloth to shading compound or paint.

3. Watch a demonstration of the use of a light meter.

4. Write answers to these questions; discuss with the class:

   a. What is a foot candle reading?
   b. When is the best time of year to apply shading compound to a greenhouse?
   c. When is the best time of year to remove shading compound from the greenhouse?
   d. Why is it important to avoid applying more compound than is needed?

5. Practice taking a foot candle power reading with a light meter.

6. Investigate and list the foot candle light requirements for plants grown in your school's greenhouse. Then, discuss how the requirements would affect plant placement in the greenhouse.

7. Watch a demonstration on how to prepare (service and fill) the spray apparatus. Note safety precautions.

8. Read the label on shading compound: note safety precautions according to content and use.

9. Practice mixing the compound and loading the sprayer.

10. Watch a demonstration on how to apply the shading compound on greenhouse glass. Note safety precautions.

11. Under the supervision of your instructor, apply shading compound to an area of greenhouse glass assigned by your instructor.

    a. Take foot candle readings and, as necessary, apply successive coats to obtain uniform readings.
    b. Discuss your work with the instructor.

12. Winterize a greenhouse by removing shading compound, as directed by your instructor.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 3: INSTALL BLACK CLOTH TO REGULATE PHOTOPERIOD

Performance Checklist

1. Select width of black cloth required to cover the entire bench with enough overlap on sides and ends to keep out all light.
2. Check support wires: be sure they are secure.
3. Trim or tape any sharp edges or wires that might snag the cloth or interfere with the covering and uncovering of plants.
4. Roll out black cloth over wires and plants.
5. Tighten cloth to prevent sagging and to keep out light.
6. Use clothes pins, clips and weights if necessary to secure ends and corners of cloth.
7. Return tools and unused cloth or other materials to storage area.
8. Remove cloth after regulated time period. Replace as required.

Test

Items Needed:

1. One or more benches or beds with growing plants
2. Black cloth
3. Support wires
4. Clothes pins
5. Clips
6. Weights
7. Light meter
8. Tape
9. Wire snips

Task: Regulate the photoperiod by installing and covering the plants with black cloth.

Standard:

1. The black cloth must eliminate all but two (2) foot candles of light during the regulated time period.
2. The black cloth must be installed so that it can be easily removed and replaced.

Learning Activities

1. Place a healthy geranium plant in complete darkness. Keep another healthy geranium in a sunny location. Wait one week. Compare the appearance of the two plants.

2. Attend a lecture-discussion on the photoperiod: definition and uses.

3. Answer these questions; then discuss:

   a. When is it necessary to install black cloth to regulate the photoperiod?
   b. For what reasons would you use this procedure?
   c. When and how is the procedure harmful to plants?

4. Read a supply catalog to find out what widths and weights of black cloth are available. Practice filling out an order form. (What kinds of information must you have to do this?)

5. Watch a demonstration on how to install black cloth to regulate photoperiod.

6. Measure and cut black fabric to cover an area assigned by your instructor.

7. Install black cloth over assigned area. Have your instructor check your work.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 4: PROVIDE THE REQUIRED LIGHT INTENSITY FOR PHOTOPERIOD CONTROL

Performance Checklist

1. Put up supports for the wire, on approximately 20-foot centers.
2. Install wire and fasten securely to the supports, with no sag between supports.
3. Clamp sockets on wire at trial spacing.
4. Rearrange sockets as necessary to provide desired amount of light.
5. Insert light bulbs into sockets.
6. Measure foot candle at night or under black cloth at edges of bench or field using light meter.
7. Readjust spacing or wattage of bulbs if a minimum of ten (10) foot candles are not being received at all points in the field or on the bench.

Test

Items Needed:
1. Greenhouse bench or field bed
2. A foot candle reading to be attained (specified by your instructor)
3. Light bulbs
4. Insulated electrical wire
5. Clamp-on sockets
6. Supports for wires
7. Light meter which can measure very low light intensities (0 - 50 foot candle)

Task: Place light bulbs at proper height and spacing to provide the minimum specified foot candle of light on all areas of the bench or bed.

Standard: A light meter reading must verify that a minimum of ten (10) foot candles is reaching all points in the field or on the bench.

Learning Activities

1. Read pp. 36-38, Greenhouse--Place of Magic.

2. Assist your instructor in a demonstration on how to provide required light intensity for photoperiod control.

3. Practice using a light meter to measure light intensity in the greenhouse.

4. Measure light intensity outdoors and compare with greenhouse readings.

5. Discuss what happens to light intensity readings on a cloudy, winter day? A sunny, summer day?

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 5: REGULATE TIME CLOCKS

Performance Checklist

1. Determine critical night period for crop.
2. Set time clock to trigger the desired response.
3. Measure light being received by the flower crop to make sure it is within five (5) percent of the required level.
4. Check "on" and "off" times of lights. Differences between desired times and actual cycling time must not exceed five (5) minutes.

Test

Items Needed:
1. Floral crop
2. Functional time clocks
3. Artificial lighting system

Task: Set clocks to provide the required duration of light ±5 percent.

Standard: Light must come on within five (5) minutes of the time specified by your instructor.

Learning Activities

1. Attend a lecture-demonstration on the effects of light/dark periods on crops grown in your locale.

2. Examine several plants--some having grown under continuous light, some under poorly regulated light-dark periods, and some under properly regulated light-dark periods.

   a. Discuss your observations.
   b. Discuss "short day" plants.

3. Practice setting a lighting schedule for mums (as assigned by your instructor).

4. Suppose four (4) hours of light are required as near the middle of the night as possible:

   a. What time should clocks be set to turn lights "on"?
   b. What time should clocks be set to turn lights "off"?
   c. Check your answers with your instructor

5. Watch a demonstration on regulating time clocks.

6. Your instructor will assign five crops:

    a. Determine the "on" and "off" times for each, according to its critical night period.
    b. Check your answers with the instructor.
    c. Regulate the time clocks according to your schedule.
    d. Your instructor will evaluate your demonstration.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 6: ADJUST OR CONTROL TEMPERATURE (AIR CONDITIONING, VENTS OR FANS)

Performance Checklist

1. Calibrate thermostat with thermometers by adjusting thermostats to correct temperature readings.
2. Operate vent openings prior to fan operation to make certain vents are functioning.
3. Bring temperature to a reading within a specified temperature range.
4. Maintain temperature within specified temperature range.

Test

Items Needed:
1. A temperature range, to be used in your greenhouse, will be supplied by your instructor.
2. Thermostats connected to air conditioning system in a greenhouse.

Task:
1. Bring the greenhouse temperature to the desired reading.
2. Control the temperature within acceptable limits.

Standard: The temperature must be brought within the prescribed temperature range within one (1) to two (2) hours after adjustment.

Learning Activities

1. Read pp. 30-35, Greenhouse--Place of Magic.

2. Attend a lecture-discussion on temperature and vent control.

3. Discuss:

   a. Temperature ranges for plants grown in your locale.
   b. Temperature ranges for plants grown in your school's greenhouse.

4. Watch a demonstration on how to calibrate a thermostat.

5. Practice adjusting thermostat to achieve a lower greenhouse temperature assigned by your instructor.

6. Answer these questions; discuss the answers:
    a. What is fan-and-pad cooling?
    b. Why is good ventilation needed in a greenhouse?
    c. What can a sudden drop in greenhouse temperature do to plants such as mums, carnations, snapdragons or roses?
    d. At what time of day are temperature changes greatest in the greenhouse?

7. Locate the vents in the school's greenhouse:
    a. Note their position(s).
    b. If necessary, service the vents to assure proper operation. Your instructor will demonstrate the safe procedure.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 7: CHECK AND MAINTAIN HEATING SYSTEMS

Performance Checklist

1. Check oil levels and replenish oil if necessary before removing filler cap on the "base," if applicable.
2. Check stack and clear if clogged or capped, if applicable.
3. Turn on or light each assigned heater in accordance with acceptable safety standards.
4. Adjust heater(s) to operate at maximum efficiency (either by increasing or decreasing the filler cap, if applicable).
5. Turn off heater(s) when instructed to do so.

Test

Items Needed: Field Heaters

1. 6 - 12 oil burning field heaters (installed as a protection against frost)
2. Oil
3. Lighter or matches

Greenhouse Heaters

1. Thermostat-controlled heating system

Task: Check, turn on and light the heaters.

Standard:

1. Heaters must be checked and lighted in keeping with acceptable safety standards.
2. Heaters must furnish heat when they have been lighted.

Learning Activities

1. Read pp. 23-29, Greenhouse--Place of Magic.

2. Attend a lecture-discussion on safe heating systems for the greenhouse. Take notes.

   a. Discuss the advantages of the systems suggested. (Consider economics as well as efficiency.)
   b. Discuss why oil, bottled gas, or radiant heaters should not be used in a greenhouse.

3. Attend a lecture on the safe use and placement of field heating systems. Take notes.

4. Watch a demonstration on how to fill a field heater.

5. Under the supervision of your instructor, fill an empty field heater.

6. Practice setting a thermostat to several different heat settings. (Your instructor will specify the settings.)

7. Turn the greenhouse thermostat setting down below the actual temperature in the greenhouse (under the supervision of your instructor). Discuss the reactions:

    a. Does the heat go off?
    b. What happens when you raise the thermostat setting above the current (regular) greenhouse temperature?

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 8: REPAIR BROKEN PIPES, SPRINKLER HEADS, MIST HEADS AND/OR VALVES

Performance Checklist

1. Operate system to identify malfunctions.
2. Check to make sure all parts, materials, and tools are available.
3. Clean any clogged sprinkler or mist heads by routing them out with a welder's tip cleaner or wire.
4. Replace damaged pipes, valves, sprinkler heads, mist heads or faulty gaskets.
5. Operate system to make sure all necessary repairs and adjustments have been made.
6. Clean all tools and equipment and return them to storage.

Test

Items Needed:
1. Malfunctioning sprinkler or mist irrigation system.
2. Welder's tip cleaner or wire
3. Replacement parts: pipes, sprinkler heads, mist heads, valves, gaskets
4. Screwdrivers, wrenches, other necessary tools

Task:
1. Check the system.
2. Repair or replace parts as needed.

Standard: There are to be no leaks, clogged heads, or faulty gaskets or valves in the system when the task is finished.

Learning Activities

1. Read pp. 154-157, Nursery Production--A Student Handbook.

2. Discuss why it is important to know the source of the water you use in a sprinkling or misting system.

3. Watch a demonstration on how to repair and replace a broken pipe. Take notes of procedures and safety precautions.

4. Under the supervision of your instructor, repair or replace a broken pipe.

5. Watch a demonstration on how to repair a clogged mist head. Take notes of procedures and safety precautions.

6. Under the supervision of your instructor, practice routing out a clogged mist head or sprinkler head.

7. Watch a demonstration on how to replace a broken valve. Take notes of the procedures and safety precautions.

8. Under the supervision of your instructor, repair or replace a broken valve (as assigned by your instructor).

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 9: FORCE BULBS (CONTROL TEMPERATURE, MOISTURE AND LIGHT)

Performance Checklist

1. Drench bulbs with fungicide.
2. Plant bulbs in desired medium.
3. Place planted containers in cold storage, at 40°F for a period of time calculated according to time charts for forcing bulbs.
4. Remove container to growing area at appropriate time for that particular variety.
5. Maintain moisture and light levels as near the desired level as possible.

Test

Items Needed:

1. Dutch bulbs which are to be forced to meet a prescribed time schedule
2. Fungicide
3. Applicator
4. Finishing container
5. Cold storage unit
6. Cultural guides
7. Bulb planter or hand trowel

Task:

1. Follow the cultural guides to determine the correct treatment.
2. Control the temperature, moisture, and light to force bulbs to meet required schedule.

Standard: At least 95 percent of the bulbs must produce flowers on schedule.

Learning Activities

1. Attend a lecture-discussion on forcing bulbs.

2. Discuss:

   a. Kinds, strengths, uses and application of fungicides.
   b. Plants grown in your locale which can be forced for early marketing.
   c. How to create a bulb-forcing schedule.

3. Create a bulletin board showing different types of bulbs:
   a. Place bulbs in small plastic bags.
   b. Fasten bags to bulletin board.
   c. Label each variety.

4. Develop a bulb-forcing schedule for the bulbs on the bulletin board. Post the schedule.

5. Plant three (3) pots of lily bulbs for Easter in an outdoor trench to shorten the time required to bring bulbs to flower:
   a. Select a sunny, southern location outdoors.
   b. Dig a trench deep enough to sink pots with rims 1-2" below soil level.
   c. Prepare labels and insert in pots for later identification of plants.
   d. Line trench with dry leaves before setting in pots for easier pot removal.
   e After setting pots in trench, mound a layer of raked leaves over top of trench.
   f. Place board on top of trench to prevent leaves from blowing away.
   g. After 12 weeks, lift pots. If roots have formed and shoots are up, bring pots indoors to cool, dark location where temperature is not above 60°.
   h. Water plants for a week. Then move them to a sunny location.

6. Identify and write the procedure for forcing tulips, daffodils, hyacinths, and/or crocuses.

7. Force several of the plants listed in Learning Activity 6, as assigned by your instructor.
   a. Keep a record of your activities: note date and general conditions of the environment for each activity.
   b. Have your instructor evaluate your work. Discuss the evaluation with the class and your instructor.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module A: Physical/Mechanical Environmental Controls

Task 10: RAISE OR ELEVATE BEDWIRE

Performance Checklist

1. Loosen ties or hanger brackets where bedwire is secured to posts or steel support stakes at ends of bed.
2. Loosen, raise and reattach one side of bedwire at the desired height.
3. Loosen, raise and reattach the other side of bedwire so that it will be level with the opposite side.
4. Raise and reattach ends of bedwire to same level as the sides.
5. Return pliers and unused materials to their appropriate places.

Test

Items Needed:
1. Pliers
2. Tie wire
3. Flower crop growing in a greenhouse or shadehouse
4. Bedwire (already in place)
5. Your instructor will specify the height to which the bedwire is to be raised

Task: Raise the bedwire to a specified height.

Standard:
1. The bedwire must be raised to ±1/2 inch of the prescribed level.
2. The bedwire must be well secured.
3. No more than 0.01 percent of the growing plants are to be injured in the process.

Learning Activities

1. Assist your instructor in a demonstration on elevating bedwire.

2. Explain to class why it is necessary to raise bedwire from time to time.

3. Ask another student why it is so important for the bedwire to be level when raised? What would happen to the plants on the low side?

4. Show a partner how to raise a bedwire to a height assigned by your instructor. Have your instructor check your work.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module B: Chemical Environmental Controls

Task 1: APPLY GROWTH REGULATING CHEMICALS

Performance Checklist

1. Review manufacturer's specifications, especially those having to do with safety and rate of application.
2. Check sprayer for cleanliness and working order.
3. Fill sprayer with required spray solution.
4. Bring tank to required air pressure.
5. Spray plants, covering entire leaf area.
6. Clean sprayer and other equipment, making sure that sprayer is thoroughly rinsed and that screens and nozzles are treated with diesel fuel to prevent corrosion.

Test

Items Needed:
1. Sprayer
2. Growth regulating chemical solution
3. Manufacturer's specifications
4. Floral plants to be treated
5. Water and hose
6. Diesel fuel

Task: Apply the spray solution.

Standard: The chemical solution must be sprayed uniformly and evenly over the entire leaf area of the plant.

Learning Activities

1. Attend a lecture-discussion on growth-regulating chemicals. Take notes.

2. Look-up and record the chemical content of a number of growth-regulating chemicals or chemical compounds:

   a. Discuss the contents of each in terms of:
      (1) What is causes to happen to the plant.
      (2) Whether it is toxic or non-toxic.
      (3) Safety and first aid.

   b. Identify several commonly-used growth regulating chemicals or chemical compounds by trade name. Discuss:
      (1) Uses for specific crops.
      (2) Application conditions and procedures.

3. Watch a demonstration on servicing and preparing the sprayer. Take notes on procedure and safety precautions.

4. Practice servicing and preparing the sprayer.

5. Under the supervision of your instructor, apply a growth regulating chemical (such as gibberellic acid) to an actively growing chrysanthemum plant. Keep an identical plant which has not been treated as a control plant:

    a. After two weeks, compare the two plants.
    b. Discuss your observations with the class.

6. Under the supervision of your instructor, apply phosphon to an actively growing holly or chrysanthemum plant. Keep an identical but untreated plant as a control plant:

    a. After two weeks, compare the two plants.
    b. Discuss your observations with the class.

7. Under the supervision of your instructor, apply B-Nine to three (3) poinsettia plants and three (3) mum plants. Follow the label instructions for the chemical exactly. Keep three untreated plants of each type as control plants:

    a. Record the differences noted in the plants' growth after two (2) and four (4) weeks.
    b. Discuss your observations with the class.

8. Watch a demonstration on cleaning the equipment.

9. Clean and store equipment; discuss:

    a. Consequences of improper cleaning.
    b. Consequences of improper storage.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module B: Chemical Environmental Controls

Task 2: APPLY GRANULAR FERTILIZER

Performance Checklist

1. Check fertilizer spreader to determine that it is functional.
2. Mark off 100 - 500 square feet of land area for testing and calibrating the spreader.
3. Set feed controls on spreader to apply desired amount of fertilizer.
4. Adjust setting up or down as necessary to achieve desired rate.
5. Calculate new rate and adjust setting further, if necessary.
6. Using a systematic procedure, pull spreader with tractor and apply fertilizer.
7. Wash out spreader with water to remove dust or granules that have a corrosive effect on spreader and cause rust.
8. Treat moving parts of spreader with oil and store when job is finished.

Test

Items Needed:

1. Granular fertilizer
2. An application rate, specified by your instructor
3. A plot of land where a floral crop is to be planted
4. Broadcast fertilizer spreader
5. Tractor
6. Hose and water
7. Oil

Task:

1. Calibrate the spreader to deliver the specified amount of fertilizer.
2. Apply the fertilizer.

Standard:

1. There must be no spills.
2. The fertilizer must be applied uniformly at the specified rate ± five (5) percent.
3. There must be no overlapping or skipped spaces.

Learning Activities

1. Watch the filmstrip, Fertilizing Ornamental Plants (Vocational Educational Products, California State Polytechnic College).

2. Attend a lecture-discussion on uses and application of granular fertilizer.

3. Look up and record the chemical content of several granular fertilizers:
    a. Discuss the contents of each in terms of:
        (1) What it causes to happen to the plant.
        (2) Whether it is toxic or non-toxic to animals, water, etc.
        (3) Safety and first aid.
    b. Identify several commonly used granular fertilizers by trade name. Discuss:
        (1) Uses for specific crops.
        (2) Application conditions and procedures.

4. Watch a demonstration on servicing and connecting the spreader. Take notes of procedure and safety precautions.

    NOTE: IF TRACTOR AND SPREADER ARE TO BE USED FOR THIS TASK, your instructor will provide necessary instruction on their use and servicing. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, December, 1978.)

5. Under the supervision of your instructor, practice connecting and disconnecting the spreader.

6. Watch a demonstration on calibrating the spreader. Take notes of procedure and safety precautions.

7. Under the supervision of your instructor, set feed controls on the spreader to apply the amount of fertilizer necessary to achieve the rate specified for a crop assigned by your instructor.

8. Watch a demonstration on operating the tractor and spreader to spread fertilizer evenly at the desired rate.

9. Under the supervision of your instructor, operate the tractor with attachments in a large area.

10. Under the supervision of your instructor, spread granular fertilizer evenly on an assigned plot of ground.

11. Watch a demonstration of equipment cleaning and storage. Follow these procedures to clean and store all equipment you use.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module B: Chemical Environmental Controls

Task 3: APPLY LIQUID FERTILIZER

Performance Checklist

1. Calculate amount of irrigation water to be applied for unit area of crop.
2. Calculate amount of liquid fertilizer required to produce desired ratio of water to fertilizer.
3. Inject liquid fertilizer into irrigation system in accordance with requirements of system.
4. Time irrigation to apply required amounts of fertilizer.
5. Flush system following use to prevent corrosion and deterioration of the system.
6. If detergent is used in flushing, select a detergent that will not harm the crop.

Test

Items Needed:
1. Floral crop to be fertilized
2. Automatic irrigation system
3. Liquid fertilizer
4. The desired ratios of fertilizer liquid to water (as specified by your instructor)
5. Injection system
6. Water and hose
7. Detergent

Task: Apply the liquid fertilizer with the injection system.

Standard:
1. The liquid fertilizer must be applied in the amounts designated by your instructor.
2. There must be no missed or over-saturated spots.

Learning Activities

1. Read pp. 158-160, Nursery Production--A Student Handbook.

2. Research and discuss with the class:

   a. Advantages/disadvantages of liquid fertilizing versus granular fertilizing.
   b. Chemical contents of liquid fertilizers.
   c. Toxic and non-toxic qualities of liquid fertilizers.
   d. Trade names of liquid fertilizers:
      (1) How they are prepared.
      (2) How they are used.

3. Visit at least one growing area that has an irrigation system through which liquid fertilizer is applied:

   a. Observe the amounts and procedures for mixing the fertilizer and water.
   b. Note the frequency of application periods.
   c. Note the amounts applied during each application period.
   d. Observe a worker setting the irrigation timer.

4. Attend a lecture-discussion on calculating the water-fertilizer mix for crops.

5. Practice calculating the water-fertilizer mix for several specific crops grown in your locale, as assigned by your instructor.

6. Watch a demonstration by your instructor on measuring and mixing and injecting liquid fertilizer into an irrigation system. Note safety precautions.

7. Measure and mix liquid fertilizer:

   a. Your instructor will assign the mix.
   b. Read container label carefully.
   c. Record the ingredients and recommended uses, as described on the label.

8. Watch a demonstration on applying liquid fertilizer.

   a. Inject into irrigation system, as directed by your instructor. Set timer.
   b. Spread liquid fertilizer with tractor and tank, if so directed by your instructor and under the instructor's supervision.

   NOTE: IF TRACTOR AND TANK ARE TO BE USED FOR THIS TASK, your instructor will provide necessary instruction on their use and servicing. (See Tractor Mechanic Competency-Based Education Curriculum, West Virginia Department of Education, 1978.)

9. Watch a demonstration on flushing and servicing the equipment. Note safety precautions.

10. Flush and store the equipment, as directed by the instructor.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module B: Chemical Environmental Controls

Task 4: LOCATE AND REPORT ANY MALFUNCTIONS OF FERTILIZER INJECTION SYSTEM

Performance Checklist

1. Confirm general location of malfunctioning components of system.
2. Pour test dye into the water in injection tank.
3. Take water samples from injector in a clear glass bottle.
4. Compare the injector samples with water in the injection tank.
5. If the color of water from the injector system is not the same color as the water in the injection tank, the system is clogged at some point.
6. Check samples of water from several points in the system to find the exact location of the problem.
7. Report the malfunction and its exact location to your immediate supervisor.

Test

Items Needed:
1. A malfunctioning system for injecting liquid fertilizer into an automatic irrigation system
2. Liquid fertilizer
3. Test dye
4. Clear glass bottles

Task: Locate and report malfunctions of fertilizer injection system to your instructor.

Standard: All malfunctions must be located and reported.

Learning Activities

1. Watch a demonstration on how to locate a malfunction in a fertilizer injection system.

2. Read the label on the dye package to make sure the dye is safe to use on plants.

3. Test run the dye through a fertilizer injection system.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module C: Soil Preparation

Task 1: CULTIVATE (TILL) SOILS

Performance Checklist

1. Identify plot of land to be tilled.
2. Service and check out tiller.
3. Adjust depth setting on tiller by adjusting depth control mechanism.
4. Till assigned area by (1) starting on one side of the field, or (2) by starting in the middle and making consecutive overlapping passes until the entire field is finished. Either procedure is acceptable.
5. Clean tiller following use and store it in its proper place.

Test

Items Needed:
1. Tiller or cultivator
2. Plot of land in a shadehouse or open field

Task: Till or cultivate the soil systematically.

Standard:
1. All safety precautions will be followed.
2. Tilled soils must be broken up, pulverized, and left in a loose, friable condition.
3. There will be no large holes or "hummocked" areas.

Learning Activities

1. Attend a lecture-discussion on soil tillage. Take notes on:
   a. Why soil is tilled.
   b. Organic additives.

2. Discuss the uses of: well-rotted manure; sawdust; peat moss.
   a. What does each add to the soil?
   b. When would you use each kind?

3. Watch a demonstration on the use of a tiller or cultivator. Take notes on procedures. Note safety precautions.

4. Write answers to these questions, then discuss:
   a. Why is it necessary to cultivate soil before planting?
   b. What would happen to drops planted in hard ground?

   c. What happens to crops planted in deep holes which were overlooked when soil was cultivated?
   d. How soon can you plant crops after cultivating the soil?

5. Cultivate an assigned area, assigned by your instructor. Have your instructor check your work.

6. Watch a demonstration on cleaning and storing equipment.

7. Clean and store equipment. Have your instructor check your work.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module C: Soil Preparation

Task 2: AERATE COMPACTED SOILS IN BEDS

Performance Checklist

1. Feel and squeeze the soil to determine density and/or porosity and degree of aeration required.
2. Mix proportionate amounts of sand, perlite, vermiculite, peat moss, pine bark, cypress shavings, or other organic material. Amount to be mixed will vary with the degree of porosity desired.
3. Add mixed materials such as vermiculite, peat moss or other organic residues to the existing medium, using a trial and error process to determine the exact quantities of the various materials.
4. Store equipment and unused materials after preparing aeration mixture.

Test

Items Needed:

1. Pine bark
2. Cypress shavings
3. Peat moss
4. Sand or clay
5. Perlite or vermiculite
6. Shovel
7. Hoe
8. Garden rake
9. Plot of ground with compacted soil

Task:

1. Determine the soil ratios of sand/clay to organic materials.
2. Aerate the compacted soil using the materials provided.

Standard:

1. The physical condition of compacted soils will be made much more porous and friable.
2. Aerated soil must be sufficiently porous to permit adequate circulation of air and to retain water.

Learning Activities

1. Read pp. 31-33, Introductory Horticulture.

2. Experiment:

   a. Put two inches (2") of coarse gravel into the bottoms of two jars.
   b. Place a small amount of sand in one jar and a small amount of clay in the second jar.
   c. Pour a cup of water into each jar.
   d. Record how long it takes the water to drain down to the bottom in each jar.

3. Explain to the class how soils become compacted in beds.

4. Read the label on a package of vermiculite or peat moss to determine the uses for each product.

5. Take a soil sample from two different areas:

   a. Analyze your samples to determine what material, if any, should be added to make your samples more porous.
   b. Discuss your analyses with the class.

6. Watch a demonstration on testing and increasing aeration.

7. Your instructor will assign a crop for which soil must be aerated:

   a. Take a sample; analyze whether or how much aeration is needed.
   b. Select the additive. Check with your instructor.
   c. Apply and mix in the additive.
   d. Have your instructor check your work.

8. Clean, secure and store equipment and unused materials in the manner demonstrated by your instructor.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module D: Crop Care

Task 1: SCHEDULING

Performance Checklist

1. Write a crop care plan for every month of the year.
2. Schedule maintenance and repair of equipment during winter months.
3. Inventory supplies and order needed items during winter months.

Test

Items Needed: Care instructions for each crop

Task: Schedule crop care.

Standard:
1. Each crop must be cared for according to its specific seasonal requirements.
2. Work load must be evenly distributed over 12 month period.

Learning Activities

1. Read pp. 217-219, Nursery Production--A Student Handbook.

2. Discuss the following statement: "Plants grown and not sold because the market was soft on the particular variety represent serious loss of profit."

3. Write to the Grower Service Department of a seed dealer: request any record-keeping forms that would be useful in scheduling operations in a nursery or greenhouse.

4. Prepare a list of nursery/greenhouse operations.

5. Interview a local nursery/greenhouse manager to find out the best month to schedule all the items on your list.

6. Write answers to these questions, then discuss:

    a. How does a grower know what types of seeds and how many to plant from year to year?
    b. Which is the best month of the year for starting seeds for Memorial Day geranium sales?
    c. In which months are most flowering spring annuals started?

7. Develop a calendar of operations for your school greenhouse. Include, in addition to those items in the Performance Checklist:

   a. Scheduled sowing date for various types of seeds.
   b. Quantity of seed to be sown.
   c. Scheduled transplanting date(s).
   d. Scheduled date plants will be ready for sale.

8. Discuss your calendar with the instructor. Does your calendar agree with the instructor? Do others in the class have items you forgot? Are your dates realistic?

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module D: Crop Care

Task 2: STAKE AND TIE PLANTS

Performance Checklist

1. Identify the particular plants needing to be staked and tied.
2. Place stakes in such a way that they will not damage plant roots and at sufficient depth to sustain the plants.
3. Tie plants to stakes firmly to hold them in an upright position, but not so tightly that stems will be damaged or growth impeded. Larger plants should be tied both at or near the top and also near the bottom.
4. Return tools and extra materials to storage when the job is completed.

Test

Items Needed:
1. Twine
2. Stakes
3. Flowering plants requiring support (other than the support provided by roots)
4. Knife

Task: Stake and tie the plants.

Standard:
1. Support stakes must be placed in such a way that they will not:
   a. Damage existing roots.
   b. Impair root development.
2. String must be tied to support plants without cutting or damaging the stems and branches.

Learning Activities

1. Discuss with your class:

   a. Kinds of plants that need to be staked.
   b. When various kinds of plants must be staked.
   c. How staking and tying aids growth.

2. Experiments:

   a. Compare a plant that was properly staked and tied with one that was not.
   b. Pull out a plant whose roots were damaged by staking.
   c. Examine a plant that suffered stem/branch damage by tying.
   d. Discuss your observations.

3. Watch demonstrations on staking and tying several kinds of plants.

4. Select three (3) chrysanthemum plants for staking:

    a. Push wooden or bamboo stakes into the soil without damaging the roots of each plant. Your goal is to preserve the natural growth pattern of each plant.
    b. When tied, your plants should not be bunched together like cornstalks.

5. Stake three (3) carnation plants so that their stems will grow straight.

6. Select a large potted plant, such as a split-leaf philodendron. Stake the plant (using a decorative piece of bark) so that the plant will continue to grow upward, without the weight of the heavy leaves causing the main stem to bend.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module D: Crop Care

Task 3: PINCH FLOWERING PLANTS

Performance Checklist

1. Identify flowering plants to be pinched.
2. Grasp stem tip and young immature leaves of each plant, snapping them from plant by means of thumb and forefinger.
3. Accumulate severed tips and leaves in the pail provided for that purpose and discard.

Test

Items Needed:	1. Flowering plants in pots, beds, or a field area 2. Pail or other receptacle
Task:	Pinch the flowering plants.
Standard:	1. Plants four (4) to six (6) inches in height: only four (4) to six (6) leaves will be left on the pinched stem. 2. Small plants: only the very tip of the stem (about 1/2 inch) will be pinched.

Learning Activities

1. Read pp. 159-166, Introductory Horticulture.
2. Check your local newspaper or a periodical for a column on gardening:
    a. Cut out the columns that interest you and start your own file on gardening hints.
    b. Staple each column to an 8-1/2" x 11" piece of paper; write the subject of the column at the top of the page.
    c. Keep an orderly file. (File by plant name--common or botanical or by season or by type/location of growing conditions.)
    d. At the end of the term, your instructor will evaluate your collection.
3. Attend a lecture-demonstration on how and why to pinch flowering plants.

4. Using ten (10) chrysanthemum plants supplied by your instructor:

   a. Pinch back five developing chrysanthemum plants.
   b. Keep the other five unpinched plants as check plants.
   c. Label each plant.
   d. Observe the difference in growth patterns. (As soon as flowering stems appear, discontinue pinching and allow plants to bloom.)

5. Select four (4) developing poinsettia plants:

   a. Pinch back the terminal ends of three (3) of the plants. (Label.)
   b. Keep and label the unpinched plant.
   c. When plants are in full bloom, compare the number of bracts on the pinched plants with the number of bracts on the one you labeled as "Not Pinched."

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module D: Crop Care

Task 4: DISBUD FLOWERING PLANTS

Performance Checklist

1. Determine purpose for which plant is being grown.
2. Pinch off buds, using thumb and forefinger. Work systematically from one end of the bed to the other.
3. Dispose of part removed from plants.

Test

Items Needed:
1. Six (6) or eight (8) flowering plants in the bud stage, or six (6) chrysanthemum plants in the bud stage, or a greater number of plants growing in a bed.
2. Instructor's statement of reason for which plants are being grown.

Task: Disbud the plants.

Standard:
1. Plants must be disbudded without any unnecessary damage.
2. Plants must be disbudded in such a way that their intended utility (use) will be achieved.

Learning Activities

1. Read pp. 175-176, Introductory Horticulture.

2. Attend a lecture-discussion on disbudding. Discuss:

   a. Why some plants are disbudded and some are not.
   b. What proportion of your greenhouse crop should be disbudded.
   c. Why removed buds should be disposed of.

3. Select five (5) young chrysanthemum plants:

   a. Disbud each plant to develop larger flowers.
   b. Only the top terminal bud should be left to flower on each branch.

4. Demonstrate to the class how a potted mum should be disbudded:

   a. Disbud only the smaller side buds.
   b. Explain the purpose of disbudding to the class.

Student Competency Sheet

Duty III: CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Module D: Crop Care

Task 5: PRUNE PLANTS

Performance Checklist

1. Identify each plant and the purpose for which it is to be pruned.
2. Prune plant to restrict growth and induce branching by taking off the tips of all the stems.
3. Prune the plant designated for pruning to improve shape: cut or clip off unbalanced, or unsymmetrical, branches and stems.
4. Prune plant from which dead leaves and diseased plant parts are to be removed to groom it for sale: pinch or cut off all dead leaves or other plant parts and cut out spindly or weak shoots.
5. Collect all plant parts removed in the pruning process and dispose of same.

Test

Items Needed:
1. Pruning knife
2. Shears
3. Bucket or pail
4. three (3) potted plants

Task:
1. Prune one plant to restrict growth and induce branching.
2. Prune one plant to improve its shape.
3. Prune one plant to remove dead or diseased plant parts. Groom this plant for sale.

Standard: Each plant must be pruned to improve shape and salability.

Learning Activities

1. Read pp. 375-382, Introductory Horticulture.

2. Watch the film: Pruning Practices at Brooklyn Botanic Garden. (Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, NY 11225.)

3. Watch the filmstrip: The Elements of Pruning (Vocational Education Products, California State Polytechnic College).

4. Discuss:

   a. Reasons for pruning specific kinds of plants.
   b. Pruning techniques for specific kinds of plants.

5. Visit a local nursery to observe professional pruning techniques.

6. Collect various branches of trees and shrubs and bring them to class.

    a. Watch a demonstration of pruning techniques. Take notes of procedure and safety precautions.
    b. Take turns demonstrating the proper pruning technique for each type of branch.

7. Under the supervision of your instructor, prune selected shrubs on the school grounds.

8. Experiment with holding a plant over for another season:

    a. Select a poinsettia after its bracts have fallen off.
    b. Move the plant to a cool, dark location and let stand.
    c. When warm weather comes, prune stems back to no more than eight (8) inches.
    d. Water plant.
    e. Set plant in sunny location, with evening temperature not above 60°.

9. Obtain three potted plants from your instructor. Perform the stated "Task" for this activity. Have your instructor check your work.

DUTY IV

IRRIGATION PRACTICES

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Set time control valves (clocks) to meet irrigation schedules
- Regulate trickle irrigation systems
- Replace valves and gaskets on irrigation systems
- Hand irrigate plants

Student Competency Sheets

Duty IV: IRRIGATION PRACTICES

Module A: Mechanical Adjustments and Repairs

Task 1: SET TIME CONTROL VALVES (CLOCKS)

Performance Checklist

1. Obtain irrigation schedule.
2. Observe system to determine cycling.
3. Set time clocks to confirm to desired schedule.
4. Test system on new schedule to make certain it is reliable, making such adjustments as may be required.

Test

Items Needed:
1. Automatic irrigation system that is operating well on a specified cycle
2. Time clocks
3. Irrigation schedule and cut off intervals, as specified by your instructor

Task: Reset the time clocks so that the valves will open and close properly for implementing the new schedule.

Standard: When the time clocks have been reset and adjusted, the actual cycling must not deviate from the prescribed cycling schedule by more than four minutes.

Learning Activities

1. Read pp. 154-157, Nursery Production--A Student Handbook.

2. Invite a local nursery owner or manager to talk to your class about the importance of irrigation systems and the different types of irrigation systems used in a nursery or greenhouse.

3. Write answers to these questions; then discuss:

   a. Why are semi-automatic irrigation systems used for watering nursery container stock?
   b. How do you determine which plants need watering?
   c. What are some of the factors to consider before deciding how frequently plants should be watered?

4. Watch a demonstration on setting time clocks.

5. Ask your instructor to give you three (3) time schedules for setting time control valves:

a. Set the clocks.
b. Observe the valve cycle to see if valves are opening and closing at the time intervals you set.

Student Competency Sheet

Duty IV: IRRIGATION PRACTICES

Module A: Mechanical Adjustments and Repairs

Task 2: REGULATE OVERHEAD IRRIGATION SYSTEM (TIME CLOCKS)

Performance Checklist

1. Operate system and observe current cycling pattern.
2. Remove timing stops; replace them to meet a specified or given schedule. (Timing stops are located on a round dial which is marked off in minutes and seconds.)
3. Check system to be sure proper station is in operation at the time indicated on the irrigation schedule.
4. Set time clock so that it corresponds to time of day.
5. Operate system to check cycling. Adjust if necessary.

Test

Items Needed:
1. Irrigation well
2. Pumping station
3. Control center with timing system
4. Time schedule to be programmed, as specified by your instructor
5. Watch

Task: Change the irrigation cycle by setting time clocks to meet a specified irrigation cycle.

Standard:
1. The specified schedule must be programmed correctly on the time clock.
2. The system must cut "off" and "on" according to schedule.

Learning Activities

1. Attend a lecture-demonstration on:
   - a. Determining an irrigation cycle for specific crops.
   - b. Regulating an overhead irrigation system.
2. Discuss what would happen to a crop if the overhead irrigation system's time clocks:
   - a. Failed to turn "On" at the proper interval.
   - b. Failed to turn "Off" at the proper interval.

3. Ask your instructor to assign you a crop to be irrigated:

   a. Calculate the on-off intervals of the irrigation cycle. Have your instructor check your work.
   b. Set the timing stops on your irrigation system.
   c. Observe the operation of the overhead system: be sure the proper station is being irrigated and the desired on-off cycle is maintained.
   d. Check mist valves: be sure all are operational and giving off an equal amount of moisture.

Student Competency Sheet

Duty IV: IRRIGATION PRACTICES

Module A: Mechanical Adjustments and Repairs

Task 3: REGULATE TRICKLE IRRIGATION SYSTEM (OOZE SYSTEM)

Performance Checklist

1. Read gauge and determine if reading is too high or too low when stabilized.
2. Adjust regulator handle to obtain desired reading.
   Caution: The system should be adjusted while it is in operation to insure accurate pressure readings.
3. Check system for leaks; repair any leaks.
4. Read gauge and make final adjustments based on irrigation requirements.

Test

Items Needed:
1. Trickle irrigation system which requires regulation
2. Pressure gauge
3. Pressure regulator

Task: Regulate the trickle irrigation system to a pressure specified by your instructor.

Standard: The adjusted pressure must be corrected ±1/2 pounds per square inch.

Learning Activities

1. Attend a lecture-discussion on trickle (ooze) irrigation systems. Discuss the value of these systems in terms of:

   a. Their value in terms of irrigating specific crops.
   b. Their value in terms of water needed to operate the system.
   c. Costs and methods of installation.
   d. Operating and maintenance costs.

2. Attend a lecture on how to determine irrigation requirements in using a trickle (ooze) irrigation system.

3. Watch a demonstration on how to regulate a trickle irrigation system and how to use a pressure gauge. Take notes.

4. Determine the water needs of a group of plants, as assigned by your instructor.

5. Watch a demonstration on maintenance and repair of the system (See IV-A-4 and IV-A-5). Take notes of the procedure and safety precautions.

6. Under the supervision of your instructor, check the system and repair leaks.

7. Set the regulator at a reading assigned by your instructor.

   a. Read the gauge to see if the proper pressure is provided.
   b. Make necessary adjustments. Have your instructor check your work.
   c. Check the entire trickle irrigation system for leaks. Be sure that all parts of the system are working properly.

Student Competency Sheet

Duty IV: IRRIGATION PRACTICES

Module A: Mechanical Adjustments and Repairs

Task 4: REPLACE VALVES ON IRRIGATION SYSTEM

Performance Checklist

1. Operate system to determine which valves require replacement.
2. Turn off irrigation system.
3. Remove faulty valve.
4. Install new valve.
5. Operate irrigation system to make sure newly installed valves function without leaks.
6. Return tools and unused materials to storage.

Test

Items Needed:
1. An irrigation system in which certain valves need to be replaced.
2. Valves
3. Wrenches
4. Other necessary hand tools
5. Pipe compound

Task: Replace the valves on the irrigation system, as designated by your instructor.

Standard:
1. Pipe compound must be used on all threaded fittings.
2. Valves must function properly without any leaks.

Learning Activities

1. Discuss what happens to crops when a faulty valve is not replaced.

2. Watch a demonstration on replacing irrigation system valves. Take notes of procedure and safety precautions.

3. Ask your instructor to designate a valve to be replaced:

   a. Under the supervision of your instructor;
      (1) Remove the faulty valve.
      (2) Clean pipes and fittings.
      (3) Replace the valve and tighten.

   b. Operate the irrigation system; check for leaks.

4. Visit a local greenhouse or nursery. Observe a demonstration of irrigation systems in operation.

5. Write a report:

   a. Describe the irrigation methods observed on your visit (or in your laboratory).
   b. Draw a sketch of the irrigation method(s) observed.

Student Competency Sheet

Duty IV: IRRIGATION PRACTICES

Module A: Mechanical Adjustments and Repairs

Task 5: REPLACE GASKETS ON IRRIGATION SYSTEM

Performance Checklist

1. Identify leaking gaskets.
2. Remove leaking gaskets.
3. Install new gaskets.
4. Operate system to be sure gaskets do not leak.
5. Discard old gaskets and return tools to storage.
6. Clean up work area.

Test

Items Needed:

1. Irrigation system with leaking gaskets
2. Wrenches
3. Other necessary hand tools
4. Gaskets

Task: Replace gaskets on the irrigation system.

Standard:

1. The leaking gaskets must be correctly identified.
2. Gaskets must be correctly installed within a time period as specified by your instructor.
3. There can be no leaks when the task is completed.

Learning Activities

1. With the help of your instructor, identify a leaking gasket.

2. Watch a demonstration on how to replace irrigation system gaskets.

3. Remove a faulty gasket identified by your instructor; inspect the leaking gasket, then answer the following questions:

   a. Does the gasket look worn or thin?
   b. Does the gasket feel hard, dry, or cracked?
   c. How is the old gasket different from the new gasket you are going to install?

4. Install a new gasket:
    a. Clean all surfaces that come in contact with an irrigation system gasket.
    b. Install the new gasket; tighten the bolts securely around the gasket.
    c. Operate an irrigation system and check for leaks.
    d. If the system is still leaking, install another gasket and test the system again. Have your instructor check your work.

Student Competency Sheet

Duty IV: IRRIGATION PRACTICES

Module B: Water Application

Task 1: HAND IRRIGATE PLANTS (HAND WATERING)

Performance Checklist

1. Decide whether irrigation is to be with a watering can (with sprinkling spout) or with a hose with water breaker.
2. Locate source of water; attach hose to fill can or feed the water breaker.
3. Apply water according to plant's requirements. (Most greenhouse plants have been irrigated sufficiently when the water first starts to ooze out of the bottom holes in the flat or container.)
4. Empty watering cans and/or turn off water source for hose to prevent hose from rupturing.
5. Drain excess water from hose.
6. Store cans, hose(s) or other equipment each day following use.

Test

Items Needed:
1. Plants requiring hand irrigation
2. Water
3. Garden hose with a water breaker
4. Sprinkling can

Task:
1. Determine how much water to apply.
2. Hand irrigate plants as needed for a period of one full week.

Standard:
1. All plants are to receive the required amount of water.
2. No plants are to be damaged either by receiving too much water or by washing out the growing mediums if watered too fast.

Learning Activities

1. Discuss the following with the class:
   a. How do you determine which plants need to be watered?
   b. What temperature should water be when hand-watering plants?
   c. Should only distilled water be used in hard-water areas?
   d. What causes a white crust to form on top of pot soil in some potted plants?

2. Select a group of plants to be watered. With your instructor, review how much water these plants should have.

3. Practice watering plants with a watering can.

4. Practice watering plants with a hose with a breaker.

DUTY V

PLANT PEST AND DISEASE CONTROL

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Examine plants for insect damage and disease
- Remove dead and diseased plants and plant parts
- Remove weeds manually from potted plants and floral crops
- Repair lines and nozzles on spray equipment
- Mix and apply chemicals for bench or field treatment
- Clean spray equipment
- Identify spray damage
- Set out poisoned bait to eradicate rodents

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module A: Identification of Pests/Diseases

Task 1: REPORT DISEASE AND INSECT DAMAGE

Performance Checklist

1. Identify area in which floral plants are to be observed.
2. Observe plants, distinguishing between damage caused by insects and that which appears to be the result of disease.
3. Report findings, describing insect and disease damage.

Test

Items Needed:
1. Hand lens or other magnifying glass
2. Floral plants growing in a greenhouse, shadehouse, or in an open field
3. Illustrations of insect pests and diseases

Task:
1. Examine the plants for:
   a. Signs of insect damage.
   b. Symptoms of disease.
2. Report the damage.

Standard:
1. 90 percent of any observable and distinguishable damage must be correctly reported.
2. The report must distinguish between damage caused by:
   a. Disease
   b. Insects

Learning Activities

1. Read pp. 193-203, Introductory Horticulture.

2. Visit the library to investigate the emerging use of organic pest control measures; write answers to the following questions; then discuss:

   a. What is an organic pesticide?
   b. Are organic pesticides safer to use than commercial pesticides?
   c. Are organic pesticides less expensive than commercial pesticides?
   d. What materials and equipment are necessary to make an organic pesticide?

3. Collect samples of pests and diseases of ornamental plants in the fall or spring of the year.
    a. Make a chart: identify each specimen and the plant it was obtained from.
    b. Using Information Sheet XI-B-1, compare your samples with the insect descriptions provided.
    c. Discuss whether or not you think the crop yield and quality will be reduced enough by the pest damage to require pest control measures.

4. Interview the manager of a local greenhouse about the most troublesome plant insects. Write a report on your interview; include:
    a. Names of plant pests.
    b. Type of plants affected.
    c. Nature and extent of plant damage.
    d. Methods used to treat the infected plant.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module A: Identification of Pests/Diseases

Task 2: REMOVE DEAD AND DISEASED PLANTS

Performance Checklist

1. Review symptoms of most common diseases of floral plants.
2. Remove all plants that have serious symptoms of disease.
3. Dispose of all diseased plants.

Test

Items Needed:
1. Plants grown in beds, pots, or frames in the greenhouse or shadehouse (These are to be commercially important floral plants.)
2. Information Sheet XI-B-1

Task:
1. Observe and examine the plants regularly.
2. Remove diseased plants.

Standard: At least 90 percent of seriously diseased plants must be identified and removed from the stock of healthy plants.

Learning Activities

1. Read pp. 207-213, Introductory Horticulture.

2. Discuss the importance of removing diseased plants from healthy plants.

3. Watch as your instructor demonstrates removal and disposal of dead and diseased plants.

4. Answer and discuss the following questions:

   a. What is the best method of disposal of diseased plants?
   b. Why is it important to carefully dispose of diseased plants?
   c. Can diseased plants be treated and saved?

5. Identify diseased plants (on the benches, in the field, or in your home):

   a. Identify and describe the disease.
   b. Identify corrective measures.
   c. Discuss your work with the instructor.

6. Remove and dispose of dead and diseased plants which have been identified by your instructor.

7. Visit your local library:

   a. If they have a U.S. Government Documents section with descriptive pamphlets on insects and plant disease, select two pamphlets that interest you. Read and take notes.
   b. Write a brief report on each of the pamphlets.
   c. Describe to your class any information in the pamphlets which pertains to your work in class.

8. Write to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402:

   a. Explain that you are a student of floriculture; request any pamphlets or literature available on plant disease and insects.
   b. In the same letter, request that your name be placed on the mailing list to receive information about future publications.
   c. Have your instructor check your letter.
   d. Mail the letter.
   e. Keep a file of documents you receive. Organize the file by subject.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module A: Identification of Pests/Diseases

Task 3: REMOVE DEAD AND DISEASED PLANT PARTS

Performance Checklist

1. Identify plants from which diseased parts are to be removed.
2. Remove diseased plant parts without damaging plants.
3. Destroy plant parts that have been removed according to the teacher's instructions.

Test

Items Needed:
1. Floral shears
2. Knife
3. Potted plants or other floricultural products grown for market, provided by your instructor
4. Container for collecting diseased plant parts

Task: Remove all dead or diseased parts which might detract from the appearance of the plants or interfere with their market value.

Standard: All dead or diseased plant parts are to be removed without damage to healthy plant parts.

Learning Activities

1. Discuss the following with your class:
   a. What happens to the price of a plant when dead and diseased parts are not removed?
   b. Why is it important to remove all dead and/or diseased plant parts immediately?
   c. What might happen to a plant which has part of the outer covering of its stem stripped during removal of dead leaves?

2. Watch a demonstration on how to remove and dispose of dead and diseased plant parts.

3. Select a group of plants with dead leaves. Remove all dead and diseased parts so that the plants can be sold at the average market price for their size and type.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module B: Elimination of Weeds

Task 1: REMOVE WEEDS MANUALLY FROM POTTED PLANTS

Performance Checklist

1. Identify flowering plants in pots from which weeds are to be removed.
2. Systematically remove weeds and roots of weeds with fingers.
3. Dispose of collected weeds.

Test

Items Needed:
1. One or more benches in the greenhouse filled with potted flower or foliage plants of variable size and species
2. Container for collecting weeds
3. Illustrations of weeds commonly found in potted plants

Task: Manually remove all weeds growing in the potted plants.

Standard:
1. 98 percent of the visible weeds must be removed within a period of time specified by your instructor.
2. Plants will not be damaged.

Learning Activities

1. Read the definition of a weed on p. 217, Introductory Horticulture.

2. Answer and discuss the following questions:

   a. Why are weeds removed manually from potted plants (instead of using a herbicide)?
   b. Is a weed a weed wherever it grows? If not, what are some examples?
   c. Why can't weeds be left in potted plants in a shop?
   d. Why is it important to remove plant weeds when they are still young?

3. Make a chart for the bulletin board:

   a. Draw a sketch or mount a preserved sample of weeds commonly found in the greenhouse or shop.
   b. Draw a sketch or mount a preserved sample of weeds commonly found in local outdoor planting areas.
   c. Take turns identifying the weeds by name.
   d. Label each sample/sketch.

4. Watch a demonstration of manual removal of weeds from potted plants.

5. Ask your instructor to supply you with a group of plants to be weeded by hand:

    a. Remove the weeds without damaging the root structure of the plant.
    b. Replace as much of the original growing medium as possible to assure adequate nutrition of the plant.
    c. Clean the area.

6. Experiment: Select six (6) potted plants with weeds:

    a. Weed only three (3) of the plants.
    b. Allow weeds to continue growing in the other three (3) plants.
    c. After three weeks, compare the plants and discuss:
        (1) Appearance of the plants.
        (2) Growth patterns of the two sets of plants.
        (3) Sale value of the two sets of plants.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module B: Elimination of Weeds

Task 2: REMOVE WEEDS MANUALLY FROM FLORAL CROPS

Performance Checklist

1. Identify beds or other area to be weeded.
2. Remove weeds by cutting them out with a hoe or other suitable implement. Check carefully for weeds that might be hidden by the foliage of the floral crop.
3. Dispose of weeds that have been removed.
4. Clean and store hoe or other tools following use.

Test

Items Needed:
1. Field area or bed of flowering plants
2. Hoe or other suitable tool
3. Waste container

Task: Remove the weeds from floral crops.

Standard:
1. Floral plants must not be damaged in the weeding process.
2. 95 percent or more of all visible weeds must be cut off below ground level and removed.

Learning Activities

1. Watch a demonstration on manual removal of weeds from field crops or beds.

2. Identify weeds growing in an area assigned by your instructor:

    a. Identify the floral crop (by common name and botanical name).
    b. Identify the weeds (by common name and botanical name).

3. Discuss disposal of weeds.

    a. Can they be used for compost?
    b. Is burning a satisfactory method of weed control?

4. Your instructor will assign an area to be weeded:

    a. Remove weeds. Be sure to remove the entire root system of the weed to prevent further growth.
    b. Dispose of weeds that have been removed, as directed by the instructor.
    c. Demonstrate correct cleaning and storage of tools.
    d. Have your instructor check your work.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module C: Chemical Treatment of Pests/Diseases

Task 1: REPAIR LINES AND NOZZLES ON SPRAY EQUIPMENT

Performance Checklist

1. Assess damage to spray equipment.
2. Remove damaged or nonfunctional hoses, pipes, or nozzles.
    a. Splice or replace ruptured hoses.
    b. Straighten, couple, or replace damaged pipes.
    c. Clean or replace clogged or damaged spray nozzles.
3. Operate spray equipment to make sure it is operational and, especially, that it emits a uniform spray when repairs have been made.
4. Clean and return unused or salvageable materials or parts to storage.

Test

Items Needed:
1. Spray equipment with nonfunctional hoses, pipes, lines, and/or nozzles
2. Replacement parts
3. Hand tools

Task: Repair the spray equipment.

Standard: After being repaired, each nozzle on the sprayer will apply the same amount of spray without more than a ten (10) percent variation between nozzles.

Learning Activities

1. Read pp. 200-203, Introductory Horticulture.

2. Answer and discuss the following questions:

    a. What is calibration?
    b. What happens to crops when sprayers have not been properly calibrated?
    c. When is the best time to spray insects?

3. Examine several brands of spray equipment. Then discuss:

    a. Uses for the various types.
    b. The proper way to use each type. Note safety precautions.
    c. Comparative costs of operation and maintenance.
    d. Cleaning and storage procedures.

4. Watch a demonstration of the following:

   a. Types of damage to spray equipment.
   b. Procedures for repair of damaged spray equipment. Take notes on safety precautions.
   c. Operation of spray equipment.
   d. How to check nozzles for uniform spray application.

5. Under the supervision of your instructor, repair a damaged piece of equipment. Have your instructor check your work; discuss your use of hand tools and other equipment.

6. Check the nozzles on spray equipment to be sure they are all clear. If they are not in working order:

   a. Report the damage or malfunction to your instructor. Discuss the repairs.
   b. Make necessary repairs.
   c. Check the equipment.
   d. Clean the work area.
   e. Have your instructor check your work.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module C: Chemical Treatment of Pests/Diseases

Task 2: MIX CHEMICALS

Performance Checklist

1. Review mixing procedures as provided by manufacturer to determine (a) exact procedures to be followed in mixing and (b) the amount of spray solution required.
2. Review safety precautions and measures to be followed in mixing.
3. Mix required amount of spray solution.
4. Clean all containers and other items used for mixing.
5. Return containers, tools and any unused materials to storage.
6. Dispose of used cartons or other contaminants in accordance with current Environmental Protection Agency regulations. Caution: Do not burn pesticide containers.

Test

Items Needed:
1. Your instructor will specify either
   a. a number of plants to be treated, or
   b. a land area to be treated
2. Water
3. Chemicals
4. Sprayer
5. Safety equipment necessary for mixing
6. Copy of manufacturer's specifications
7. Copy of EPA regulations on use and disposal of chemicals and their containers

Task: Mix the required amount of spray solution for use on the specified plants or land area.

Standard:
1. Chemicals must be mixed according to the manufacturer's specifications, using all safety precautions.
2. The amount of the spray and the concentration of the solution shall be mixed without more than a ± five (5) percent error.

Learning Activities

1. Read the Environmental Protection Agency (EPA) regulations on use of chemicals and disposal of unused chemicals and of chemical containers. Then discuss in terms of:

    a. Why the regulations are necessary.
    b. How the regulations affect:
        (1) The manufacturer of chemicals.
        (2) The farmer, flower grower, and other users of the chemicals.
        (3) The natural environment.
        (4) The buying public (added costs of plants and flowers).
        (5) The general public.
    c. Penalties for not following the regulations.
    d. How/where to obtain copies of new regulations.

2. Watch a demonstration on the use of safety equipment required during the mixing of chemicals.

3. Watch a demonstration on the exact procedures to follow when mixing chemicals.

4. Answer and discuss these questions:

    a. Where can you find out the correct amount of chemical to use?
    b. Why is it necessary to wear safety equipment when mixing chemicals?
    c. What safety equipment must be used during the mixing procedures?
    d. Why must all mixing items be thoroughly cleaned after each use?

5. Carefully read the label on the chemical container. Note the ingredients and safety precautions recommended by the manufacturer.

6. Your instructor will assign a chemical mix:

    a. Put on safety equipment.
    b. Mix the chemical according to label directions.
    c. Clean up and dispose of cartons, etc., according to directions.
    d. Have your instructor evaluate your work.

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Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module C: Chemical Treatment of Pests/Diseases

Task 3: APPLY CHEMICALS

Performance Checklist

1. Check the sprayer to be sure it is in good working order.
2. Using water rather then spray solution, calibrate the sprayer to apply precise amount of spray desired.
3. Put on appropriate clothing for meeting safety requirements.
4. Put spray solution in sprayer.
5. Bring spray tank to recommended pressure.
6. Apply spray to plants.
7. Thoroughly wash and clean sprayer and all equipment used when task is completed.
8. Return all tools and equipment to storage.

Test

Items Needed:
1. Land area or greenhouse plants
2. Chemical solution
3. Sprayer
4. Recommended clothing or other safety equipment
5. Hose
6. Water
7. Container for disposing of empty chemical containers and unused spray

Task: Apply the chemical spray solution.

Standard:
1. All necessary safety precautions must be followed.
2. The solution must be applied uniformly at the recommended rate.
3. The solution must cover the plants uniformly and thoroughly.

Learning Activities

1. Read pp. 123-127, Nursery Production--A Student Handbook.

2. Watch the filmstrip: How to Safely Use Sprays and Dusts on Plants (American Institute of Biological Sciences, Prentice Hall Media).

3. Identify and post the telephone number and address of your local Poison Control Center.

4. Use your local telephone directory: make a list of local pesticide service companies, then:

    a. Invite a pesticide service representative to speak to your class.
    b. Ask the guest speaker to describe:
        (1) How insects are identified.
        (2) How insecticides are chosen.
        (3) How insecticides are applied.
        (4) The cost(s) of the pesticide control service.

5. Attend a lecture-discussion on poisonous substance control and first aid.

6. Answer the questions on the "Pesticide Application" Self-Check Test V-C-3. Discuss any questions you are unsure of.

7. Watch a demonstration on:

    a. How to calibrate and operate a sprayer.
    b. How to apply spray.
    c. How to clean and store spray equipment (see V-C-4).

8. Your instructor will assign an area:

    a. Prepare the safety equipment/clothing.
    b. Prepare the spraying equipment.
    c. Spray the plants.
    d. Clean and store equipment.
    e. Discuss your performance with the instructor.

SELF-CHECK TEST
V-C-3

Apply Chemicals

Pesticide Application

Answer the following questions:

1. Why should you avoid spraying pesticides on other crops or bee yards?
2. What would happen if farm animals ate food or drank water that had been sprayed with pesticides?
3. What should you do if chemicals are spilled on your skin?
4. List two major precautions when disposing of empty chemical containers.
5. List two immediate steps to take if you think someone has been poisoned.
6. Why is smoking not allowed while spraying chemicals?
7. List five major precautions when storing chemicals.
8. List four important kinds of information to read on the label before using a chemical?
9. What should you do if a pesticide is splashed in the eyes?
10. What are the two immediate steps to take if a person has inhaled a poisonous pesticide?
11. How can you tell when the proper amount of spray insecticide has been applied to a plant?

ANSWER SHEET
V-C-3

Apply Chemicals

Pesticide Application

1. The same chemicals cannot be sprayed on all crops because of possible damage to stems or leaves. Spraying bee yards could interfere with the pollination process.

2. Food products, such as eggs or milk, could become contaminated and unfit for eating.

3. Wash chemical off skin immediately with soap and water.

4. a. Keep empty containers out of reach of children and animals.
   b. Do not pollute streams, ponds, or other water sources.

5. a. Read label instructions carefully; note ingredients.
   b. Call local Poison Control Center or doctor promptly: follow their instructions.

6. Many chemicals contain flammable substances which could cause fire or explosion.

7. a. Store chemicals in a locked storage area.
   b. Store chemicals away from food or feed
   c. Store chemicals in their original containers.
   d. Containers must be clearly labeled.
   e. Store chemicals out of the reach of children or animals.

8. a. Proper amounts to use.
   b. Proper method of application.
   c. Safety precautions.
   d. Antidotes in case of poisoning.

9. Flush the eyes immediately with clean water for five minutes.

10. a. Assist or carry the victim to fresh air, then
    b. Call the Poison Control Center.

11. Enough spray should be applied so that the liquid "just begins to drip" from the leaves.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module C: Chemical Treatment of Pests/Diseases

Task 4: CLEAN SPRAY EQUIPMENT AFTER USE (NOZZLE, TANKS, HOSES, ETC.)

Performance Checklist

1. Collect all spray equipment for cleaning.
2. Flush clean water through unit to reduce concentration of chemical.
3. Flush unit again using trisodium phosphate (one (1) point for 25 gallons of water) or other suitable detergent.
4. Disassemble nozzles and filters.
5. Wash entire unit thoroughly to remove all chemical and dirt.
6. Dry each part thoroughly and coat with oil.
7. Reassemble spray equipment and store in dry place.
8. Store nozzles and accessory parts of equipment not used often in small can or bottle containing diesel fuel.
9. If any sprayer parts cannot be drained for winter storage, a solution of 1/2 antifreeze and 1/2 water should be run through the sprayer.

Test

Items Needed:
1. Spray equipment
2. Detergents (trisodium phosphate)
3. Air hose
4. Water
5. Dry cloth
6. Storage can or bottle containing diesel fuel

Task: Clean all parts of spray equipment, including:
- a. Hoses
- b. Tank
- c. Nozzles
- d. Filters

Standard:
1. Spray equipment will be free of all trash, sediments, corrosive acids, and alkali residues.
2. Corrosive-prone parts will be coated with a film of oil.

Learning Activities

1. Watch a demonstration on the proper procedures for cleaning spray equipment.

2. Answer these questions:

   a. Why is it important to thoroughly clean spray equipment after each use?
   b. How does detergent aid in removing chemicals from spray equipment?
   c. Why are many chemicals corrosive in nature?

3. Practice cleaning spray equipment which has been used to apply chemicals. Have your instructor check your work before returning the equipment to storage.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module C: Chemical Treatments of Pests/Diseases

Task 5: IDENTIFY AND REPORT SPRAY DAMAGE

Performance Checklist

1. Review characteristics of spray damage in contrast to damage resulting from drought, application of excessive amounts of fertilizer, or insects.
2. Identify the bed to be examined for spray damage.
3. Identify spray-damaged area. Describe the damage and report it in writing.

Test

Items Needed:
1. Pencil
2. Pad
3. Floral plants

Task: Make a written report of spray damage you identified, including a description of the damage.

Standard:
1. All spray damage will be reported.
2. Eight (8) out of every ten (10) statements in your written report must be verifiable as correct.

Learning Activities

1. Listen as your instructor described the appearance of a typical spray-damaged area. Take notes.

2. Research answers to these questions:

   a. How does spray damage differ from insect and disease damage?
   b. Can spray damage be as harmful to plants as pest damage?

3. Discuss with your class and then write a report or make a chart. Describe the appearance of plants damaged by:

   a. Application of too much spray or the wrong kind of spray (spray-damaged).
   b. Application of too much fertilizer.
   c. Drought
   d. Disease
   e. Pests

4. Examine an area assigned by your instructor:

    a. Write a description of any evident spray damage.
    b. Explain whether or not the damaged plants can be saved.
    c. Explain how the damage could be reversed to save the crop.

5. Visit a local greenhouse or nursery to observe spraying techniques. Report your observations to the class.

Student Competency Sheet

Duty V: PLANT PEST AND DISEASE CONTROL

Module C: Chemical Treatment of Pests/Diseases

Task 6: SET OUT POISONED BAIT TO ERADICATE RODENTS

Performance Checklist

1. Identify area to be baited.
2. Place bait so that it will be accessible to rodent pests without danger to desirable animals.
3. Store equipment and unused bait after use.
4. Dispose of dead rodents when found.

Test

Items Needed:
1. Poison bait
2. Area designated by your instructor as the area where rodents are to be controlled
3. Safety equipment for handling poisoned bait

Task: Set out the poisoned bait.

Standard:
1. Bait must be placed where it is likely to be eaten by rodents.
2. Bait must not be placed where it could be eaten by domestic animals or desirable wildlife.
3. Control measures should result in a 90 percent decrease in rodent damage.

Learning Activities

1. Read p. 211, Introductory Horticulture.

2. Review information on poisonous substance control and first-aid.

3. Discuss whether natural predators such as snakes, skunks, weasels, hawks, owls, and foxes should be encouraged to aid in reducing the rodent population.

4. Research and write the answers to these questions; discuss with the class:

   a. Where should bait be placed for best rodent control?
   b. How is poisoned bait placed to prevent accidental poisoning of desirable animals?
   c. If heavy rain follows soon after baiting traps, is retreatment necessary?
   d. How do rodenticides kill rats and mice?

   e. Why is an apple sometimes used to bait mice? Would a sweet potato be an effective bait?
   f. What is a bait station?

5. Watch a demonstration on:

   a. Rodent-baiting procedures.
   b. Disposal of dead rodents and unused bait.
   c. Equipment care and storage.

6. Bait an area assigned by your instructor:

   a. Prepare safety equipment.
   b. Prepare bait, following all label directions.
   c. Set the bait, as directed by your instructor.
   d. Return all unused bait and equipment to safe storage.
   e. Dispose of dead rodents, as directed by your instructor.
   f. Have your instructor check your work.

DUTY VI

HARVESTING CROPS

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Harvest flowers
- Count and bunch flowers
- Prepare and place cut flowers in water or preservative
- Place plants in storage
- Treat bulbs or corms to control fungi or other disease organisms
- Select salable plants
- Remove bedwire from harvested areas
- Sanitize production areas

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module A: Flowers

Task 1: CUT FLOWERS

Performance Checklist

1. Check for special buyer requirements and grade specifications.
2. Identify the particular beds or field areas from which flowers are to be harvested.
3. Harvest (cut) the flowers in late bud or early bloom stage of development, meeting market requirements.
4. Place flowers from the baskets or other containers in the truck or other vehicle provided.

Test

Items Needed:
1. Containers (baskets, etc.)
2. Truck or other vehicle
3. Cutting knife
4. List of buyer requirements

Task: Cut (harvest) the flowers.

Standard:
1. Flowers must be at late bud or early bloom stage of development.
2. Flowers must be free from disease.
3. Flowers must meet market requirements.

Learning Activities

1. Attend a lecture-discussion on:
   - a. Why flowers are harvested in late bud or early bloom stage rather than in full bloom stage.
   - b. Financial loss due to the number of diseased flowers or flowers with broken heads or stems. (If flowers are damaged in shipment, who pays for the loss: grower, shipper, or buyer?)
   - c. When to establish the market for flowers; where and how to establish the market.
   - d. Financial loss due to over-planting and under-selling.
   - e. Financial loss due to under-planting and over-selling.
2. Watch a demonstration on:
   - a. How to harvest (cut) specific kinds of flowers.
   - b. How to arrange cut flowers into baskets without damage.
   - c. How to load cut flowers in truck without damage.

3. With your instructor, read an order or list of buyer requirements. Then,

   a. Locate flowers which meet the requirements.
   b. Cut the flowers which meet the requirements; i.e., fill the order.
   c. Load them into the cart or container, without breaking any heads or stems.
   d. Load them into the truck (or other vehicle provided).
   e. Have your instructor check your work.

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module A: Flowers

Task 2: COUNT AND BUNCH FLOWERS

Performance Checklist

1. Review prescribed standards for counting and bunching before beginning the task.
2. Identify the flowers to be counted and bunched.
3. Trim, count and bunch flowers according to standards for extra fancy, fancy, or number one grades.

Test

Items Needed:
1. Flowers
2. Standards to be followed in counting and bunching (provided by your instructor)
3. Rubber bands
4. Trimming knife

Task: Count and bunch the flowers.

Standard:
1. The count must be 100 percent accurate.
2. Stems must all be pointing in the same direction.
3. Stems must be of uniform length when placed in the bunch.
4. Bunches must be firmly bound together by double or triple wrapping with a rubber band, without bruising or crushing the stems.

Learning Activities

1. Attend a lecture-discussion on grading flowers.

2. Ask your instructor to assign a crop of flowers for grading. Then;

   a. Identify ten (10) of the crop that qualify as "extra fancy" grade.
   b. Identify ten (10) of the crop that qualify as "fancy" grade.
   c. Identify ten (10) of the crop that qualify as "number one" grade.

3. Watch as other members of your class grade different crops of flowers. Compare your opinion of the grade of the flowers with your classmates' and instructor's opinions.

4. Watch a demonstration on how to trim, count, and bunch flowers.

5. Answer and discuss these questions:

   a. How many flowers are normally included in one bunch?
   b. Does the number of flowers bunched together depend upon the type of flower?
   c. When trimming stems, why should all the stems be cut to approximately the same length?
   d. Why must the stems all point in the same direction when flowers are bunched?
   e. When bunching flowers, why are the heads grouped in several layers or rows?

6. As assigned by your instructor, trim, count and bunch flowers. Have your instructor check your work.

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module A: Flowers

Task 3: PREPARE AND PLACE CUT FLOWERS IN WATER OR PRESERVATIVE

Performance Checklist

1. Remove all diseased and malformed floral specimens and discard.
2. Count and bunch special varieties before treating.
3. Trim stems so that all are freshly cut and approximately the same length.
4. When properly trimmed, place flowers in dividers within the preservative (which should be at or only slightly below room temperature).
5. Clean the work area and dispose of culled or discarded flowers when task is completed.

Test

Items Needed:
1. Preservative solution
2. Vats or other containers
3. Shears
4. Cut flowers
5. Dividers or racks

Task:
1. Prepare the flowers.
2. Place the flowers in the solution.

Standard:
1. Stems will be freshly cut to a uniform length.
2. The solution will cover not less than 1/3 or more than 1/2 the length of the stems.

Learning Activities

1. Attend a lecture-discussion on the use of preservatives:
    - a. Preservative solutions recommended for specific flowers.
    - b. The economic value and preservative value of a preservative solution versus plain water.
2. Watch a demonstration on:
    - a. Preparing solutions.
    - b. Preparing flowers for treatment.
    - c. Placing flowers in solution.

3. Answer and discuss:

   a. What is the purpose of dividers or racks in the preservative or holding containers?
   b. Why should all diseased or malformed flowers be discarded before placing cut flowers in water or preservative?
   c. Why shouldn't the entire stem be submerged in the water or preservative?
   d. What would happen if cut flowers were placed in hot water?
   e. What would happen if cut flowers were placed in very cold water?

4. Experiment: Obtain two bunches of flowers:

   a. Trim and remove foliage as necessary.
   b. Place one bunch in container filled with water.
   c. Place the other bunch in container or preservative mixed with water.
   d. After 24 hours, compare the condition of the two bunches of flowers.

5. As assigned by your instructor, prepare and place cut flowers in water or preservative. Have your instructor evaluate your work.

6. Visit a commercial greenhouse and a florist:

   a. Observe the kinds of preservatives and storage facilities used.
   b. What length of time do they consider flowers to have market value? At what stage of flower development do they:
      (1) Mark down prices?
      (2) Throw away unsellable flowers?
      (3) How much do the mark-downs and throw-aways affect their costs and profit?

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module A: Flowers

Task 4: PLACE PLANTS (FLORAL AND FOLIAGE) IN STORAGE

Performance Checklist

1. Identify kinds of plants to be stored.
2. Prepare plants for storage according to their particular needs.
3. Place plants in storage.

Test

Items Needed:
1. Storage facilities
2. Plants to be stored
3. Knife
4. Container with water or other preservative

Task:
1. Prepare the plants.
2. Place plants in storage.

Standard: No plants are to be damaged.

Learning Activities

1. Read Module FD-8 in Volume I, Retail Flower Shop Salesperson and Floral Management.

2. Attend a lecture-discussion on how temperature affects:

   a. Plant growth.
   b. Market value of cut flowers.

3. Attend a lecture-discussion on the do's and don'ts of placing plants in low-temperature storage:

   a. What varieties of plants can be stored in the storage cooler to slow down bloom development?
   b. What is the safe-temperature range for specific plants grown in your school's greenhouse?

4. Make a list of 20 common house plants; draw four columns to the right of the list (You are making a chart):

   a. Label the first column "Light" and then describe lighting conditions necessary for each plant.
   b. Label the second column "Temperature" and then describe safe-temperature ranges for each plant.

   c. Label the third column "Moisture" and then describe water/moisture requirements for each plant.
   d. Label the fourth column "Nutrients" and then describe the nutrients and recommended applications for each plant.
   e. Compare your list with those of your classmates. Share the charts: make copies and keep in your permanent file.

5. Attend a lecture-discussion on storage units:

   a. Temperature regulation and maintenance.
   b. Moisture maintenance (cold storage units and high-humidity units).
   c. Arrangement of stored plants-flowers in the storage unit.
   d. Cleaning.

6. Explain how special storage techniques can temporarily slow further bloom to Easter lilies (which may flower too early for holiday sales).

7. Experiment:

   a. Store three (3) Easter lilies in a refrigerated room without lights, at a temperature of 38-40°.
   b. Select three (3) more Easter lilies at the same stage of bloom: do not refrigerate them; do not deprive them of light.
   c. After two weeks, compare the two groups of plants for condition, appearance, and stage of bloom.

8. Experiment:

   a. Place a mature poinsettia plant in a storage facility which provides high humidity (so that its foliage will not drop prematurely).
   b. Place a mature poinsettia plant in an area with normal, room-level humidity.
   c. After two weeks, compare the two plants for condition, appearance, and stage of bloom.

9. Prepare plants or cut flowers (assigned by your instructor) for storage:

   a. Check the moisture level of the storage cooler. (Moisture should be high enough to prevent flowers from drying out but not high enough to cause mold or mildew.)
   b. Place the container(s) so that there is sufficient space between containers to allow air to circulate freely.
   c. Place the containers so that the blooms are decorative and appealing to customers.
   d. Inspect storage area for dead or deteriorating plant material. Remove and discard dead materials.

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module B: Bulbs and Corms

Task 1: TREAT BULBS OR CORMS TO CONTROL FUNGI OR OTHER DISEASE ORGANISMS

Performance Checklist

1. Identify bulbs or corms to be treated.
2. Determine which method of treatment is to be used.
3. Treat bulbs in accordance with recommended practices for either dust or dip method of treatment.

   Dust Method:
   a. Treat only a few bulbs or corms at a time.
   b. Apply dust by hand or with dusting gun, treating entire surface of bulb or corm.

   Dip Method:
   a. Submerge bulbs or corm in dip.
   b. Drain bulbs or corms and allow to dry.
   c. Place bulbs and corms in storage.
4. Clean utensils and restore all items to their appropriate place following treatment.

Test

Items Needed:
1. Dusting gun
2. Dusting powder
3. Fungicidal dip
4. Containers
5. Metal (wire mesh) drying rack
6. Bulbs or corms

Task: Treat the bulbs or corms to control fungi or other disease organisms.

Standard:
1. If dip is used:
   a. Bulbs or corms will be completely submerged in the solution.
   b. Bulbs or corms must remain submerged ten (10) seconds.
   c. Bulbs or corms must be dried before storing.
2. If powder (dust) is used:
   a. Only a few bulbs or corms will be treated at a time to insure complete coverage.
3. Spoilage losses will be two percent or less.

Learning Activities

1. Attend a lecture-discussion on the growth of plants from bulbs or corms. Discuss.

    a. Varieties of plants which grow from bulbs or corms.
    b. Planting times, conditions, and methods.
    c. Animals, insects, and diseases which affect growth, quality, and profit/loss to the grower.

2. Research ten (10) commercially profitable plants that are grown from bulbs or corms. Then:

    a. Draw a sketch showing how bulbs or corms reproduce.
    b. Make a chart showing:
        (1) Planting time for each of the ten (10) varieties.
        (2) Planting depth and conditions for each variety.
        (3) Growth care for each variety.
        (4) Plant maturation time for each variety (to the bloom stage).
        (5) Bulb/corm maturation time for each variety (to the dig-up stage).
    c. Compare your chart with those of others in the class.
        (1) Discuss any differences in findings.
        (2) Make copies of the charts of your classmates. Keep these in your permanent file.

3. Watch a demonstration on how to dig and separate bulbs.

4. As assigned by your instructor, dig and separate bulbs. Label the containers, as directed.

5. Attend a lecture-discussion on treatment of bulbs or corms. Discuss:

    a. Preservative qualifies of fungicidal dips and dusting powder.
    b. Chemical contents of fungicidal dips and dusting powder.
    c. Safety precautions to observe when using fungicidal dips and dusting powder.
    d. Specific varieties of bulbs and corms that are treated by dipping or dusting.
    e. Spoilage resulting from improper digging or improper preservation methods.

6. Add to your chart (Learning Activity 2):

    a. Bulbs to be treated by dusting.
    b. Bulbs to be treated by dipping.

7. Answer and discuss these questions:

    a. How soon after digging should bulbs/corms be treated?
    b. In the dip method of treatment, why must the bulbs or corms be allowed to dry before being stored?

  c. In the dust method of treatment, why must the entire surface of the bulb be treated?
  d. Why is it important to clean all utensils following fungicidal treatment of bulbs or corms?

8. Examine a bulb or corm that was not treated. Discuss:

   a. What has happened to the outer-leaf portion? How does this affect the bulb?
   b. What has happened to the inner-leaf portion? How does this affect the bulb?
   c. What has happened to the heart? How does this affect the bulb?
   d. Could any growth be expected from this bulb?

9. Watch a demonstration on the dust method of bulb treatment.

10. Use the dust method to treat tulip or daffodil bulbs, as provided by your instructor.

11. Watch a demonstration on the dip method of bulb treatment.

12. Use the dip method to treat hyacinth or narcissus bulbs, as provided by your instructor.

13. Attend a lecture-discussion on proper labeling and storage of treated bulbs/corms.

14. Determine when, how, and for how long to store the bulbs/corms you treated.

    a. Discuss your plan with your instructor.
    b. Store the treated bulbs/corms, as approved by your instructor. Be sure each container is labeled correctly.

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module C: Selection and Transportation

Task 1: REMOVE SALABLE PLANTS FROM BEDS OR BENCHES

Performance Checklist

1. Review order and decide the standard for marketable plants of a particular species.
2. Collect required number of salable plants and remove them from the others.

Test

Items Needed:
1. Salable and unsalable potted plants (in greenhouse beds or benches)
2. Purchase or shipping orders

Task:
1. Select the salable plants.
2. Remove the salable plants from the unsalable plants.

Standard:
1. All the plants removed from the benches must be salable.
2. No more than ten (10) percent of the salable plants on a given bench will be overlooked.

Learning Activities

1. Read a purchase order. Is it complete?
    - a. Does it include the name, address, and phone number of the buyer?
    - b. Does it say exactly what the buyer wants: quantity, variety, and grade of plant?
    - c. Does it include the date the order was placed and the date the order is to be delivered?
    - d. Does it specify the address to which the order is to be delivered?
    - e. What other information is included?
2. Discuss the standards which make a plant marketable:
    - a. Size
    - b. State of bloom
    - c. Health
    - d. Color
3. Sort a group of benched chrysanthemums by grade.

4. Remove ten (10) salable plants of the same grade from bench stock. Label them according to grade and variety.

5. With a partner, examine ten (10) plants which you do not consider salable.

   a. Discuss why they are not suitable for sale.
   b. Discuss your decisions with the instructor.

6. Read a completed shipping order. Discuss the information on the shipping order.

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module D: Post-harvest Bed Preparation

Task 1: REMOVE BEDWIRE FROM HARVESTED AREAS

Performance Checklist

1. Identify bed from which bedwire is to be removed.
2. Remove all weeds, grass and debris from bed.
3. Remove string or wire securing bedwire to stakes.
4. Roll up bedwire into a tightly compacted roll.
5. Store bedwire properly for future use.

Test

Items Needed:
1. Greenhouse or shadehouse
2. Bedwire

Task: Remove bedwire from harvested areas.

Standard:
1. All wire or string holding bedwire to stakes must be removed.
2. Bedwire must be rolled into a compact roll.
3. Bedwire must be removed from the bedding area without damage to plants.

Learning Activities

1. Watch a demonstration on removing bedwire from harvested areas.

2. Remove bedwire from a harvested area. Have your instructor check your work.

3. Practice rolling up bedwire into a tight roll and fastening the roll to prevent unwinding. The tighter the roll of bedwire, the less storage will be required.

4. Discuss why bedwire has been called another form of staking.

5. Answer these questions:

   a. What are three popular cut flowers which benefit from bedwire support?
   b. When should bedwire be installed on greenhouse plants? When seeds are planted? Or when plants are fully grown?
   c. What material is used to make bedwire?
   d. Why must the bedwire be galvanized?

Student Competency Sheet

Duty VI: HARVESTING CROPS

Module D: Post-harvest Bed Preparation

Task 2: SANITIZE PRODUCTION AREA

Performance Checklist

1. Determine type of pest or disease present in the production area while weather is still warm.
2. Select the chemical to be applied to soil prior to frost.
3. Plow or till the area.
4. Read label on chemical for application directions.
5. Plow or till the soil to a depth of four (4) inches.
6. Apply liquid or dry chemical with sprayer or spreader.
7. Wait time specified on label before replanting in the treated area.

Test

Items Needed:
1. Chemicals for soil sanitizing
2. Sprayer for liquid chemicals
3. Broadcast spreader for dry chemicals
4. Protective clothing - mask, gloves
5. Plastic or tarpaulin

Task: Sanitize the production area.

Standard:
1. Production area must be disease free.
2. Chemical must penetrate soil to a depth of four (4) inches.

Learning Activities

1. Contact your county agricultural agent at the Cooperative Extension Service for booklets or pamphlets on sanitizing soil.

2. Invite your local extension agent to speak to your class about the newest soil sanitizing products and methods.

3. Discuss the following statement:

   The decision to chemically sanitize an area must be based on whether or not the damage is extensive enough to require the use of chemicals which will kill all living organisms in the soil, including helpful earthworms.

4. Discuss:
    a. Under what circumstances would you sanitize soil with chemicals?
    b. What alternatives are available other than chemical applications?
    c. Why are the sanitizing chemicals applied before frost?
    d. What do the chemicals actually do? How do they work on pests/disease?
    e. Why must soil be tilled or plowed to a depth of four (4) inches?
    f. Why can the treated area not be replanted immediately after application of sanitizing chemicals?
    g. How much does it cost to apply sanitizing chemicals? Estimate the annual dollar value of crops lost if soil is not treated. Compare the cost to the loss, in dollar value.

5. Watch a demonstration on sanitizing a production area with a liquid chemical. Take notes of procedure and safety precautions.

6. Watch a demonstration on sanitizing an area with a dry chemical. Take notes of procedure and safety precautions.

NOTE: IF TRACTOR AND SPRAYER/SPREADER AND PLOW ARE TO BE USED, see Tractor Mechanic Competency-Based Education (West Virginia Department of Education, December, 1978) for servicing procedures.

7. Under the supervision of your instructor:
    a. Practice connecting and disconnecting the attachments to the tractor.
    b. Apply the sanitizing chemicals, as directed. Observe all safety precautions.
    c. Clean and store equipment and have your instructor check your work.

8. Under the supervision of your instructor, practice broadcasting the sanitizing chemical with a hand spreader. Observe all safety precautions.

DUTY VII

PACKAGING, STORAGE AND SHIPMENT

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Grade potted flowers and foliage plants
- Grade cut flowers
- Prepare invoices and shipping labels
- Package orders for shipment
- Load potted plants for hauling
- Inventory plants

Student Competency Sheet

Duty VII: PACKAGING, STORAGE AND SHIPMENT

Module A: Grading

Task 1: GRADE POTTED FLOWERS OR FOLIAGE PLANTS

Performance Checklist

1. Study grades and standards for judging as contained in current or past publications of Pi Alpha Xi and other similar publications.
2. Establish a mental image for the perfect model or ideal plant.
3. Compare plants to be graded to the model.
4. Place or grade plants in accordance with mental image of the ideal or model.

Test

Items Needed:
1. 48-60 potted foliage or floral plants
2. Copy of grading standards (Pi Alpha Xi and/or other similar publication)

Task: Grade the potted plants

Standard: At least 90 percent of the plants graded must conform to the grading standards adopted by Pi Alpha Xi (the National Honorary Fraternity in Floriculture and Ornamental Horticulture).

Learning Activities

1. Read the grading standards of Pi Alpha Xi, or others provided by your instructor.

2. Watch as your instructor systematically grades several flowers and foliage plants. Ask questions if you are unsure of any of judgments.

3. Assemble five (5) potted chrysanthemum, Easter lily, or poinsettia plants for grading. Inspect each plant for the following:

   a. Color - flower and stem
   b. Shape - flower head and petals
   c. Size - flower head and length of stem
   d. Defects - split calyx, insect damage, wilt, crooked stems

4. Compare your written evaluation of each of the plants you graded (in Learning Activity 3) with that of your classmates and instructor.

5. Conduct a flower judging contest:

    a. Divide the class into three groups.
    b. Ask each group to enter six (6) pots of flowering or foliage plants.
    c. Elect one student from each group to serve as judges.
    d. The judges are to rate each plant for color, shape, size, and defects. They will deduct one point for each defect. A perfect score for a plant would be 100 points. The team with the highest score is the winner.

6. Attend a flower show. Evaluate the plants in the show, as though you were a judge. Compare your ratings with those of the judges.

Student Competency Sheet

Duty VII: PACKAGING, STORAGE AND SHIPMENT

Module A: Grading

Task 2: GRADE CUT FLOWERS

Performance Checklist

1. Identify flowers to be graded.
2. Study grade classifications for cut flowers and develop a mental image of the "perfect" flowers.
3. Grade the cut flowers based on the image of the "perfect" flower and in accordance with the standards of the Society of American Florists and adopted by Pi Alpha Xi.

Test

Items Needed:
1. 100 Carnations or other cut flowers grown for market
2. Copy of grading standards (Pi Alpha Xi and/or other similar publication)

Task: Grade the flowers

Standard: At least 95 of the 100 flowers must be placed in their correct grade as identified by the Society of American Florists (Adopted by Pi Alpha Xi).

Learning Activities

1. Read the grading standards of Pi Alpha Xi, or others provided by your instructor.

2. Watch as your instructor systematically grades several varieties of cut flowers. Ask questions if you are unsure of any judgments.

3. Assemble three (3) containers with 12 carnations in each. Judge the flowers in each container to determine which container is "Best in Show." As you grade each flower, ask yourself the following questions:

   a. Are all the flowers in the container the same color or shade? Are some too light or too dark according to the acceptable standard for the variety?
   b. Are all the flowers in the container the same size, or are some too small?
   c. Are all the flowers in the container mature? Or are they undermature, without the chance to fully bloom. Or are they overmature, with little life remaining?

4. Conduct a flower-judging contest for carnations, poms, roses or snapdragons:

    a. Have your judges deduct one point for each defect on each flower in each of three (3) containers which have been assembled by teams of students.
    b. The container with the highest score out of a possible 100 points is "Best in Show." The container with the second highest score receives "Honorable Mention."

5. Visit the grading room of a wholesale grower and discuss how cut flowers are graded for sale.

6. Write a report on your visit to a wholesaler. Include your opinion of the quality of the merchandise offered and the sanitary conditions in the greenhouses.

Student Competency Sheet

Duty VII: PACKAGING, STORAGE AND SHIPMENT

Module B: Shipping

Task 1: PREPARE INVOICES AND SHIPPING LABELS

Performance Checklist

1. Write name and address of receiver and buyer on invoice.
2. Check for presence of packer's signature.
3. Write method of shipment on invoice.
4. Indicate quantity ordered, quantity shipped, item description, and unit price.
5. Extend unit price for quantities of more than one of each item.
6. Add sales tax, if applicable.
7. Verify shipment against quantity ordered.
8. Compute invoice total.
9. Write shipping labels indicating receiver, sender, purchase order number and invoice number.

Test

Items Needed:
1. Three (3) blank invoices
2. Labels for shipping
3. Pen or typewriter
4. Sales tax chart
5. Data regarding:
    a. Materials to be shipped
    b. Name of sender
    c. Name of receiver
    d. Purchase order
    e. Invoice number
    f. Price list
    g. Name of packer

Task:
1. Prepare invoices
2. Prepare shipping labels

Standard:
1. The invoices and labels will be completed without mathematical or clerical error.
2. Extensions and totals will be verified by your instructor.
3. Labels and invoices must be written neatly and legibly.
4. Labels and invoices must be complete.

Learning Activities

1. Look at the wholesaler's invoice in Module FD-55, Retail Flower Shop Salesperson and Floral Designer.

2. Attend a lecture-discussion on preparing invoices and shipping labels:
   - a. Information that must be included:
     - (1) Where it is obtained.
     - (2) What happens if either the invoice or shipping label is incorrect or not complete.
   - b. The procedure for completing the invoice and shipping label (Use Information Sheets VII-B-1 and VII-B-1a).
   - c. Losses that occur because of incorrect/incomplete invoices or shipping labels.
   - d. How copies of the invoice are used:
     - (1) To plan future sales.
     - (2) As a safeguard to the shipper.
     - (3) To calculate monthly/annual reports.
     - (4) To follow-up on payments by the purchaser.
     - (5) To compute taxes.
   - e. Methods of delivering the invoice to the customer.

3. Design your own sample invoice. Include all information you consider to be important to both the wholesaler shipping the order and the retail florist receiving the order.

4. Answer these questions:
   - a. Why is it important to list both the quantity ordered and the quantity shipped for each item?
   - b. Why are invoices numbered?
   - c. Why should the name of the person who packed the order be included on the invoice?

5. Calculate the extended prices for the following order:

Quantity Ordered	Description	Unit Price	Extended Price
12	Dish gardens	$2.50	
60	6" potted mums	3.40	
24 paks	Dried flowers	.75 pak	
144	Cut carnations	.23 each	
8 doz.	Sweetheart Roses	5.12 doz.	

6. Explain to your class why it is so important for shipping labels for floral merchandise to be neatly written with accurate information.

7. Obtain or design an invoice (to be approved by your instructor):
   - a. Collect the information you need to complete the invoice.
   - b. Complete the invoice. (Make the number of carbon copies specified by your instructor.)
   - c. Prepare the shipping label.
   - d. Have your instructor check your work.

Information Sheet VII-B-1

SAMPLE INVOICE

Co. Certification No. N11111

Ace Nursery & Supply
Green Mountain, West Virginia 25000

Ship to:	Sold to:

Packed by:____________________ Shipped Via:______________________________

Quantity Ordered	Quantity Shipped	Description	Unit	Stock No.	Unit Price	Total Price

This space for State Department of Agriculture Inspector's Seal

This space for USDA Inspector's Seal

Information Sheet VII-B-1a

SAMPLE SHIPPING LABEL*

Ace Nursery & Supply
Green Mountain, West Virginia 25000

Ship to: ______________________ From: ______________________

Address: ______________________ ______________________

______________________________ ______________________

Customer Order Number: ______________________________

Invoice Number: ______________________________

*May be posted or stapled on to shipping container

Student Competency Sheet

Duty VII: PACKAGING, STORAGE AND SHIPMENT

Module B: Shipping

Task 2: PACKAGE ORDERS FOR SHIPMENT

Performance Checklist

1. Collect all items ordered for shipment.
2. Review any special packaging and shipping procedures for order being filled with your supervisor.
3. Inspect plants before packing to be sure they are in good condition.
4. Pack flowers or plants firmly to prevent movement in shipping.
5. Wrap plants in waxed paper, boxes or plastic wrapper, and excelsior to provide insulation for temperature control and to prevent plants from becoming too dry.
6. Include necessary invoices and shipping labels.
7. Clean the work area after completion of task.

Test

Items Needed:

1. Potted plants
2. Cut flowers
3. Wrapping paper
4. Boxes (several sizes)
5. Waxed paper
6. Plastic wrapper
7. Excelsior, newspaper, other filler
8. Invoices
9. Shipping labels
10. Enclosure cards
11. Shipping instructions (provided by your instructor)

Task:

1. Fill the orders.
2. Package the orders for shipment.

Standard:

1. Order must be packaged so as to arrive at destination in salable condition and as soon as possible.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Attend a lecture-discussion on packaging orders for shipment. Discuss:

    a. Who in the greenhouse is responsible for filling the orders?
    b. How to determine what, if any, special packaging or shipping procedures are required?
    c. What materials are needed to pack specific varieties of potted plants?
    d. What materials are needed to pack specific varieties of cut flowers?
    e. Who is responsible for damaged merchandise: shipper, commercial hauler, customer?
    f. How to pack merchandise to prevent damage to package and its contents?

2. Watch a demonstration on how to package potted plants.

3. Select three (3) 6" potted plants and practice packaging them for shipment.

4. Watch a demonstration on how to package cut flowers.

5. Practice packaging several bunches of poms for shipment.

6. Have your instructor rate your performance on Learning Activities 2 and 4. All items must be rated acceptable.

PERFORMANCE CHECK SHEET:

ACTIVITY	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Shipping instructions were reviewed before proceeding to package the order.		
2. The appropriate size box was used to package the order.		
3. Plants were wrapped in accordance with the requirements for the kinds and quantities of flowers being shipped.		
4. Newspaper, excelsior or other filler was used in packaging the order to assure arrival of shipment in good condition.		
5. Invoice and shipping labels were included with the order.		

Student Competency Sheet

Duty VII: PACKAGING, STORAGE AND SHIPMENT

Module B: Shipping

Task 3: LOAD POTTED PLANTS FOR HAULING

Performance Checklist

1. Identify all plants to be loaded and hauled.
2. Appraise the nature of the shipment--its size, shape and content--to determine the best plan for loading.
3. Load all plants that are packaged and crated at the front of the truck as compactly as possible.
4. Place heavy wooden crates on the bottom, with lighter cardboard or fragile wooden crates on top.
5. Secure bulk of shipment with rope to prevent shifting on long distance trips or poor roads.
6. Place large or single potted plants with foliage too large or extensive to crate in closely spaced boxes, open cartons, or crates.
7. Secure very large plants as necessary when the loaded plants do not occupy the total "floor" space on the truck.
8. Close and secure gates on loaded truck.

Test

Items Needed:
1. Potted plants of different sizes and shapes
2. Wooden crates (several sizes)
3. Cardboard cartons (several sizes)
4. Delivery truck

Task: Load the potted plants for hauling.

Standard:
1. Plants must be closely packed.
2. Plants must be arranged according to size to prevent damage with heaviest crates on bottom.

Learning Activities

1. Discuss shipping/hauling methods used to transport plants to market or for delivery.
   a. What types of transportation are likely to be used?
   b. Do commercial haulers provide packing specifications?
   c. Are plants covered by insurance if damage occurs during commercial hauling?
   d. What insurance must the grower provide?

2. Discuss packing containers used to ship plants and cut flowers:

   a. For which would you use cardboard cartons?
   b. For which would you use wooden crates?
   c. How do you provide moisture and temperature control when shipping plants and flowers?

3. Practice preparing a shipment of plants/cut flowers:

   a. Collect potted plants and cut flowers, according to order provided by your instructor.
   b. Pack the plants/flowers into wooden crates and cardboard cartons.
   c. Using either a truck or a floor area you have marked off to represent the "floor" of a truck, load the packages for shipping. Avoid wasting floor space.
   d. Tie a group of very large plants together to prevent:
      (1) Damage to the plants.
      (2) Shifting during the haul.

Student Competency Sheet

Duty VII: PACKAGING, STORAGE AND SHIPMENT

Module C: Inventory Control

Task 1: INVENTORY PLANTS

Performance Checklist

1. Prepare inventory sheet in advance and place it on a clip board so that it will be ready to use.
2. Count and record actual number of plants in each category, according to variety, quantity, container size, etc. Proceed systematically.
3. Total each category to obtain your final count.
4. Turn inventory over to your immediate supervisor when the inventory has been completed and checked.

Test

Items Needed:
1. Inventory sheets
2. An assortment of plants
3. Clip board
4. Pen

Task: Count and record the plants according to:
- a. Variety
- b. Quantity
- c. Container size

Standard:
1. All plants in stock must be listed on the inventory sheet.
2. Plants must be classified as to variety and container size.
3. The inventory count must be verified by your instructor.

Learning Activities

1. Read pp. 479-483, Retail Merchandising and/or read pp. 428-434, Retailing Principles and Practices.

2. Attend a lecture-discussion on the kinds of inventories that must be kept in a greenhouse or florist shop (such as equipment and supplies needed for growing, equipment and supplies needed for the office, equipment and supplies needed for packing and shipping, physical inventory of all plants, perpetual inventory of a single crop, etc.)

3. Discuss ways in which the inventory is useful to:

    a. The owner or manager
    b. The greenhouse/shop worker
    c. The bookkeeper/accountant

4. Discuss:

    a. How often should physical inventory be taken?
    b. Who should be responsible for taking the inventory?
    c. When should inventorying be done?

5. Design an inventory sheet for use in taking a physical inventory of plants. Include:

    a. Date of inventory
    b. Type of plant
    c. Variety of plant
    d. Quantity
    e. Container size
    f. Plant condition
    g. Price, if marked
    h. Name of inventory clerk

6. Review and discuss other kinds of inventory sheets.

    a. Do the samples include all the information you feel should be noted?
    b. What other kinds of information do you feel would be useful?

7. Start a perpetual inventory system for one particular crop, such as poms:

    a. Count and record the number of poms on hand on a physical inventory sheet.
    b. Record the date and your name.
    c. Update your perpetual inventory sheet every time there is a change in the number of poms on hand. (Some poms will be sold, some moved, or more plants will be added to the benches.)
    d. Have your instructor review your perpetual inventory sheet once a week.

8. Inventory the plants in an area assigned by your instructor. Use the inventory sheet you designed or one assigned by the instructor. Have your instructor check your work.

DUTY VIII

MISCELLANEOUS MAINTENANCE AND REPAIRS

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Grease equipment
- Oil electric motors
- Sharpen hand tools
- Prepare equipment for painting
- Paint equipment and greenhouse structures
- Make minor electrical repairs
- Repair wooden greenhouse benches and superstructures
- Replace and glaze broken greenhouse lights
- Replace Saran and plastic covering on greenhouse structures
- Replace support wires for Saran or black cloth

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module A: Equipment Maintenance

Task 1: GREASE EQUIPMENT

Performance Checklist

1. Check manual for location of zirks and places to be greased.
2. Locate fittings and wipe off with cloth.
3. Apply correct type grease to each zirk or other place to be greased.
4. Oil any area which manual specifies should be oiled.
5. Wipe off extra oil and grease with cloth.
6. Replace tools and manuals.
7. Place dirty wipe cloths in safety wipe cloth storage can.

Test

Items Needed:
1. Grease guns
2. Grease
3. One or more tractors or other pieces of equipment which need to be lubricated
4. Operator's manual for equipment
5. Wipe cloths

Task: Grease the equipment

Standard:
1. All parts to be greased (according to the operator's manual) must be located and greased as specified in the manual.
2. Any zirk fittings which do not take grease must be:
   a. removed and cleaned, or
   b. replaced with new zirk fittings.
3. Extra oil and grease must be wiped away.

Learning Activities

1. Watch a demonstration on how to apply grease to equipment. Take notes of procedure and safety precautions.

2. Answer and discuss the following questions:

   a. Why should equipment be greased?
   b. How often should equipment be greased?
   c. Why should extra oil and grease be wiped away?
   d. What is the best lubricant to use when greasing equipment?
   e. Why are dirty wipe cloths stored in a closed can?

3. Grease three different pieces of equipment, as assigned by your instructor. Have your instructor check your work.

4. Prepare power equipment for winter:

   a. Drain gasoline tanks.
   b. Clean and oil raw metal.
   c. Store equipment in a clean, dry shelter.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module A: Equipment Maintenance

Task 2: OIL ELECTRIC MOTORS

Performance Checklist

1. Check operator's manual to identify all cups and other receptacles requiring oil.
2. Apply oil to appropriate areas of motor.
3. Use cloth to remove excess oil.
4. Return oil and other equipment to storage.
5. Place dirty wipe cloths in safety storage can.

Test

Items Needed:
1. Electric motor
2. Operator's manual for motor
3. Oil
4. Oil applicator
5. Hand tools
6. Wipe cloths

Task Oil the electric motor.

Standard:
1. Areas of the motor must be oiled in accordance with the directions in the operator's manual.
2. All cups and other receptacles must be filled.
3. Excess oil must be wiped off.

Learning Activities

1. Watch a demonstration on oiling an electric motor. Take notes of procedure and safety precautions.

2. Answer and discuss these questions:

   a. Why should electric motors be oiled?
   b. How often should electric motors be oiled?
   c. Are all electric motors oiled in the same manner?
   d. Must the motor be unplugged from the power supply when applying oil?

3. With a small group, read and discuss the information provided on the nameplate of an electric motor.

4. Do a comparison study on maintenance and replacement costs of electric motors:

   a. In a current supply catalog or at a local store, find out the price of a new motor (as assigned by your instructor).
   b. Find out the cost of oil and an oil applicator.
   c. Find out the cost of repairing or replacing a motor which was damaged because of lack of oil.
   d. Compare the costs of regular maintenance versus repair and replacement costs. (Consider "down time" in the shop because the motor was out of order.)

5. With the help of your instructor, identify an electric motor to be oiled:

   a. Obtain the manufacturer's operating instructions for the motor you will oil.
   b. Study the recommended oiling points, as shown in the manual and as they are located on the motor.
   c. Under the supervision of your instructor, oil the motor according to the manufacturer's specifications.
   d. Have your instructor check your work.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module A: Equipment Maintenance

Task 3: SHARPEN HAND TOOLS

Performance Checklist

1. Select appropriate pieces of equipment for sharpening a given tool.
2. Practice all necessary safety precautions.
3. Sharpen tools to achieve proper blade sharpness and angle edge of the blade.
4. Clean all tools and equipment used in sharpening process and return them to their proper place in storage.

Test

Items Needed:
1. Six (6) hand tools, including:
   - a. knife
   - b. hoe
   - c. spade
   - d. pruning shears
2. Work bench with a vise
3. Files
4. Emery wheels
5. Whetstones

Task: Sharpen the tools.

Standard:
1. Tools must be safely sharpened to a keen cutting edge.
2. Tools must be safely sharpened so that the life and utility of the tools are not impaired.

Learning Activities

1. Experiment:
   - a. Select a plant unsuitable for sale. Cut or prune the plant with a dull tool.
   - b. Cut or prune the same plant with a sharp tool.
   - c. Compare the cuts made with the dull tool and the sharp tool.
   - d. Discuss the damage to the plant in terms of future growth and salability.

2. Watch a demonstration on how to sharpen several different kinds of hand tools. Take notes of procedures and safety precautions. Discuss:

   a. Why is it important to keep hand tools sharp?
   b. Why are different sharpening tools used on different hand tools?
   c. Name the metals from which different hand tools are made:
      (1) What sharpening techniques are used for each?
      (2) What maintenance techniques keep the tools from rusting or dulling?
      (3) What storage facilities are needed for the tools? For the sharpening equipment?
   d. What first-aid procedures should you know if you work with sharp tools?
   e. What safety procedures must be observed when working with various tools and sharpening equipment?
   f. How can you set up a maintenance schedule for hand tools?

3. Under the supervision of your instructor, select and sharpen at least three (3) different kinds of hand tools. Have your instructor discuss your techniques with you.

4. Make a list of all the hand tools available in the school greenhouse:

   a. Write a recommended sharpening schedule for each tool.
   b. Reorganize the list by week and month of the year.

5. Check a current catalog or local store. Find out the costs of six (6) different handtools.

6. Check a local store which provides sharpening services. Find out the costs of having the handtools sharpened there. Compare the costs with the cost of sharpening the tools in your shop.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module A: Equipment Maintenance

Task 4: PREPARE AND PAINT EQUIPMENT

Performance Checklist

1. Identify pieces of equipment to be painted.
2. Prepare equipment to be painted. Use steel wool, wire brush, or other suitable abrasive to remove loose paint, rust, and corrosion.
3. Mix paint according to color chart if mixing is required to achieve the desired color.
4. Add thinner or thinning agent, if required. Stir paint thoroughly.
5. Apply paint with spray gun or other suitable applicator.
6. Clean all applicators and other equipment following use.
7. Dispose of empty containers and trash.

Test

Items Needed:

1. Paint
2. Mixing chart (color chart)
3. Spray gun
4. Paint brush
5. Thinning agent
6. Steel wool
7. Wire brush or other suitable abrasive
8. One or more pieces of equipment which need to be painted
9. Turpentine or other paint solvent

Task:

1. Remove loose paint, rust, corrosion.
2. Paint the equipment.

Standard:

1. All loose paint, rust, corrosion must be removed and surface must be dry.
2. Paint must be applied uniformly and evenly.
3. Paint must protect the equipment against rusting and corrosion and extend the usable life and value of the equipment.

Learning Activities

1. Review catalogs which describe modern floriculture equipment and maintenance supplies.

2. Attend a lecture-discussion on care and maintenance of equipment surfaces.

3. Read a paint supply catalog:

   a. Identify paints and applicators suitable for equipment in your shop.
   b. Compare the costs of several grades of paint.
   c. Select paints to be applied to equipment, as selected by your instructor.
   d. Explain your selections in terms of:
      (1) Ingredients
      (2) Durability
      (3) Ease of application
      (4) Cost

4. Take notes of the procedures and safety precautions as you watch your instructor demonstrate:

   a. Surface preparation
   b. Paint thinning
   c. Mixing
   d. Application
   e. Clean-up

5. Experiment:

   a. Add thinner to a small quantity of paint in a plastic container.
   b. Apply the thinned paint to a small area, as assigned by your instructor.
   c. Apply paint that has not been thinned to a small area next to the first application.
   d. Compare the appearance.
   e. Perform a "scratch" test to both areas after they have dried.
   f. Discuss the experiment.

6. Prepare a piece of equipment for painting (as assigned by your instructor):

   a. Remove all loose paint, rust, and corrosion.
   b. Clean the area.
   c. Have your instructor check your work.

7. Prepare the paint and then paint the equipment you have prepared. Have your instructor check your work.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module A: Equipment Maintenance

Task 5: MAKE MINOR ELECTRICAL REPAIRS

Performance Checklist

1. Use meter or test lamp to check electrical system and identify problems:
    a. Attach meter or lamp to wiring to observe presence or absence of electricity.
    b. Check wiring for damage such as breaking and short circuits.
    c. Observe fuses or ground current interrupters for burn-out or trippage.
2. Repair or replace electricity:
    a. Turn off power to work area.
    b. Replace wiring completely or splice and insulate broken or disconnected wiring.
    c. Replace fuses or reset ground current interrupter.
    d. Use test lamp to check electrical system for proper operation.
    e. Reassemble pump.
3. Return tools and equipment to storage.

Test

Items Needed:
1. A malfunctioning electrical system
2. Meter or test lamp
3. Wire
4. Electrician's pliers
5. Screwdriver with insulated handle
6. Fuses
7. Wire strippers
8. Electrical code books

Task: Make necessary minor repairs.

Standard:
1. Any repairs must be made in accordance with standards set forth in local and national electrical codes.
2. Repairs must be rated safe and in good working order by your instructor.

Learning Activities

1. Take notes of procedures and safety precautions as your instructor demonstrates:
    a. Safe use of a meter or test lamp.
    b. Safe procedures for disconnecting electricity.
    c. How to check a malfunctioning electrical system to identify minor repairs that need to be made.

2. Explain to your class:
    a. Precautions that can be taken to prevent electrical shock when working with electrical systems.
    b. The possible harm that electrical shock can cause.

3. Invite a guest speaker-demonstrator to explain and demonstrate CPR (Cardio-Pulmonary Resuscitation).

4. Identify electrical systems in your shop or greenhouse which should be inspected regularly. Write an inspection plan.

5. Take notes of procedures and safety precautions as your instructor demonstrates:
    a. How to identify a burned-out fuse and replace it.
    b. How to ground a circuit.
    c. How to identify and repair a tripped ground current interrupter.
    d. How to splice and insulate broken or disconnected wiring.
    e. How to replace wiring.
    f. How to disassemble, repair, and reassemble a pump.

6. Under the supervision of your instructor, practice disconnecting and connecting electric power.

7. Under the supervision of your instructor, make a minor repair to a malfunctioning electrical system.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module B: Greenhouse Repair and Maintenance

Task 1: REPAIR WOODEN GREENHOUSE BENCHES

Performance Checklist

1. Identify benches requiring repairs.
2. Determine nature and extent of repairs needed.
3. Remove plants and media from benches to be repaired.
4. Square off and mark area to be repaired.
5. Remove damaged portion of bench.
6. Measure and fit new portion to bench. Replacement portion should be made of treated woods.
7. Clean area and return unused or salvageable material to storage.

Test

Items Needed:

1. Greenhouse benches which need repairs
2. T-square
3. Steel rule
4. Carpenter's pencil
5. Hand saw
6. Pencil or marker
7. Nails or other suitable fasteners
8. Claw hammer
9. Other necessary hand tools
10. Lumber
11. Wood preservative

Task: Repair the wooden greenhouse benches.

Standard:

1. Repairs must restore the benches to utility.
2. Repaired benches must be attractive.
3. Repaired benches must be sturdy.

Learning Activities

1. Read pp. 41-42 and p. 250, Greenhouse--Place of Magic.

2. Watch a demonstration on how to repair a wooden greenhouse bench. Take notes of procedure and safety precautions.

3. Practice cutting and nailing a piece of scrap lumber:

   a. Use a steel rule to measure and mark two short pieces of equal length and one long piece (equal to the combined lengths of the two short pieces).
   b. Demonstrate safe procedures for sawing the lumber.
   c. Select nails to secure the lumber.
   d. Demonstrate safe procedures in using a hammer:
      (1) Nail one short piece of lumber to the flat side of the longer piece.
      (2) Nail one short piece of lumber to the butt end of the longer piece so that you form an "L" (ell).
   e. Have your instructor check your work.

4. Discuss why only wood which has been treated with preservative should be used to build or repair benches.

5. Under the supervision of your instructor, repair a greenhouse bench. Have your instructor check your work.

6. Inspect greenhouse bench legs for rust or loose braces. Under the supervision of your instructor, make the necessary repairs:

   a. Sand and repaint bench legs with rust-preventive paint.
   b. Tighten any loose bench braces discovered during the inspection.

7. Clean areas under benches where you have worked. Remove any debris (sawdust, decayed materials, or other unwanted materials) which would encourage insects or disease organisms to gather.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module B: Greenhouse Repair and Maintenance

Task 2: PAINT GREENHOUSE FRAMES AND OTHER STRUCTURES

Performance Checklist

1. Remove loose paint, rust and corrosion with steel wool, wire brush or other suitable abrasive.
2. Mix paint according to color chart, if necessary.
3. Add thinner or thinning agent, if required, and stir thoroughly.
4. Apply spray with most suitable applicator available.
5. Clean all applicators and other equipment following use.
6. Dispose of empty containers and refuse.

Test

Items Needed:

1. Paint
2. Paint brushes
3. Spray gun
4. Wire brush
5. Steel wool
6. Sandpaper
7. Paint thinner or other thinning agent
8. Greenhouse frames, benches or other structures
9. Mixing chart (color chart)
10. Turpentine or other paint solvent

Task: Paint the greenhouse frames (or other structure designated by your instructor).

Standard:

1. The painted structures will be attractive.
2. The paint will protect the structure from the elements (wind, rain, sun, cold, etc.) and from decay or corrosion.

Learning Activities

1. Read pp. 243-44, Greenhouse--Place of Magic.

2. Attend a lecture-discussion on care and maintenance of painted surfaces.

3. With the help of your instructor, work in small groups to prepare a paint and maintenance schedule for the greenhouse.

4. Experiment:

    a. Observe a repainted surface that was scraped and cleaned thoroughly before new paint was applied.
    b. Observe a repainted surface that was not scraped and cleaned before new paint was applied.
    c. Discuss your observations in terms of the appearance and the life and utility of the paint.

5. Investigate painting costs of greenhouse parts, as specified by your instructor:

    a. Obtain paint charts from a local store.
    b. Discuss the paint you would select for the repainting of the area assigned. Include color, quality, cost, and utility.
    c. Prepare a list of the supplies and tools you would need.
    d. Check the price of each item on your list.
    e. Discuss the total cost of the items you listed. How many are reusable?
    f. Find out the cost of hiring a contractor to do the painting. Use the current local hourly rate for painters.
    g. Discuss the advantages and disadvantages of "do-it yourself" as opposed to hiring a contractor. Include considerations such as liability insurance.

6. Take notes of procedure and safety precautions as you watch a demonstration of:

    a. Preparing the area around the work to be done.
    b. Masking.
    c. Scraping and cleaning the surface.
    d. Ladder/scaffold preparation and maintenance.
    e. Thinning and mixing paint.
    f. Applying paint with a brush.
    g. Inspecting and filling a spray gun.
    h. Applying paint with a spray gun.
    i. Clean-up of brushes, spray gun, and equipment.
    j. Clean-up of the area and safe disposal of refuse.

7. Your instructor will assign an area to be painted:

    a. Perform the procedure.
    b. Have your instructor check your work.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module B: Greenhouse Repair and Maintenance

Task 3: REPLACE AND GLAZE BROKEN GREENHOUSE LIGHTS

Performance Checklist

1. Locate broken light.
2. Place ladder in position on roof and remove bar cap.
3. Remove broken glass.
4. Remove old putty from roof bar.
5. Apply glazing compound to bar.
6. Position new glass properly and firm down in putty.
7. Hammer retainer clips into bar at base of light.
8. Replace bar cap, if any.
9. Return all equipment to proper storage.

Test

Items Needed:
1. Greenhouse with broken glass
2. Replacement glass
3. Glass cutter
4. Glazing compound
5. Putty knife
6. Chisel or knife
7. Retainer clips
8. Hammer
9. Ladder
10. Steel rule

Task:
1. Replace the broken greenhouse lights.
2. Apply glazing compound.

Standard:
1. New glass must be firmly fitted.
2. Glazing compound must be applied to form a waterproof seal.

Learning Activities

1. Read pp. 240-243, Greenhouse--Place of Magic.

2. Attend a lecture-discussion on the use of glass in the greenhouse:

   a. Why glass is used.
   b. Positioning of the greenhouse in relation to sun and wind.
   c. How to prevent breakage (from trees, loose debris, etc.).
   d. Care, inspection, and maintenance.
   e. Structural support.
   f. Advantages/disadvantages of tinted glass, insulated glass, etc.

3. Answer and discuss these questions:

   a. Why would you sometimes have to replace worn panes as well as broken panes of greenhouse glass?
   b. What might happen if the glass is not firmly fitted?
   c. Why is glazing compound used instead of putty to secure greenhouse glass?
   d. Why is careful ladder placement very important when replacing greenhouse lights?
   e. Would you use the same kind of glass for a home greenhouse as you do in the school/commercial greenhouse?
   f. Can you order glass "to size" or must it always be cut (trimmed)?

4. Calculate:

   a. How many square feet of glass are there in the school greenhouse?
   b. Measure the size of the average light in the school greenhouse. (Did you find that most of the lights are the same size? If not, how many different sizes are used?)
   c. How much does one replacement light (based on the average size you measured) cost?
   d. How much would it cost to replace all the glass in the greenhouse?
   e. Check with your instructor. Do your calculations match the instructor's?

5. Watch a demonstration on safe use of the glass cutter.

6. Practice using a glass cutter to trim a piece of glass, as specified by your instructor.

7. Watch a demonstration on applying glazing compound to provide a watertight seal.

8. Practice using glazing compound, as assigned by your instructor.

9. Watch a demonstration on replacing broken greenhouse glass. Take notes of procedures and safety precautions.

10. Replace and glaze greenhouse lights, as assigned by your instructor. Have the instructor check your work.

11. As a class, winter-proof the school greenhouse by repairing damaged glass panes.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module B: Greenhouse Repair and Maintenance

Task 4: REPLACE PLASTIC COVERING ON GREENHOUSE STRUCTURES

Performance Checklist

1. Identify greenhouse area or sections in which plastic is to be replaced.
2. Remove torn or worn plastic and discard.
3. Remove old staples, nails, etc., and smooth any rough or splintered wooden edges.
4. Cut new plastic to fit area to be covered.
5. Install new plastic.
6. Return tools and unused materials to storage.

Test

Items Needed:

1. Greenhouse with a torn or damaged plastic covering
2. Plastic for replacement
3. Claw hammer
4. Screwdriver
5. Staple guns
6. Staples
7. Nails
8. Sandpaper or other abrasive substance
9. Plane
10. Batten tape, lath or other fastening strips

Task: Replace the plastic covering.

Standard:

1. New plastic must be well aligned.
2. New plastic must be firmly secured.
3. The appearance must be neat.
4. The plastic must keep out air, wind and water.

Learning Activities

1. Attend a lecture-discussion on the use of plastic coverings on greenhouse structures. Inspect these areas in your school greenhouse.

2. Watch a demonstration on replacing plastic covering on greenhouse structures.

3. Answer and discuss the following questions:

   a. What thickness was the polyethylene used?
   b. What is used to secure the plastic along its edges?
   c. What is the cost per square foot of the plastic used?
   d. What is the cost per square foot of fiberglass and glass for greenhouse covering?

4. Measure an area which needs new plastic covering and cut the plastic to fit.

5. Replace plastic covering on an area assigned by your instructor. Have your instructor check your work.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module B: Greenhouse Repair and Maintenance

Task 5: REPAIR WOODEN PORTIONS OF THE GREENHOUSE SUPERSTRUCTURE

Performance Checklist

1. Identify the repairs needed.
2. Brace superstructure prior to removing wooden portions.
3. Remove any broken, rotted, misshapen, or worn portions.
4. Measure and fit replacement part.
5. Remove braces from superstructure.
6. Return all tools and unused materials to storage.

Test

Items Needed:

1. Greenhouse superstructure with wooden portions to be repaired or replaced
2. Braces
3. Lumber
4. Hand saw
5. Band saw
6. Carpenter's pencil
7. Steel rule
8. Square
9. Hammer
10. Nails and other suitable fasteners

Task: Repair or replace wooden portions of the greenhouse superstructure.

Standard:

1. All items on the Performance Check Sheet must be rated acceptable.
2. The repaired portion of the greenhouse must be as strong and durable as the remainder of the greenhouse.

Learning Activities

1. Attend a lecture-discussion on maintenance and repair or wooden portions of the greenhouse.

2. Assist your instructor in a demonstration on repairing wooden portions of the greenhouse.

3. Answer and discuss these questions:

   a. What were the names of the parts of the greenhouse that were repaired or which are in need of repairs?
   b. How do you decide the size, type, and grade of wood to be used?
   c. What was the size and type of wood used to repair the greenhouse?
      (1) Could other types of wood be used?
      (2) If so, what kinds?
      (3) Compare the costs of the various kinds of suitable woods.

4. Watch a demonstration by your instructor on the safe use of a band saw. Take notes of the procedure and safety precautions.

5. Under the supervision of your instructor:

   a. Use a steel rule to measure a piece of scrap lumber into four equal parts. Mark as measured.
   b. Practice using a band saw to cut the lumber.

6. Watch a demonstration on installing and removing superstructure support braces. Take notes of the procedure and safety precautions.

7. Under the supervision of your instructor, practice installing and removing superstructure support braces.

8. Your instructor will assign a portion of greenhouse structure that needs to be replaced:

   Under the supervision of your instructor:
   a. Install supports.
   b. Measure the part to be replaced.
   c. Procure the wood; measure and mark the wood.
   d. Cut the wood.
   e. Fit and secure the wooden replacement part.
   f. Have your instructor check your work. Discuss your performance and how much time it took.
   g. Finish rough spots; apply paint, if necessary.
   h. Remove supports and clean the work area.

9. Discuss the evaluation on the Performance Check Sheet.

PERFORMANCE CHECK SHEET:

ACTIVITY: Repair Wooden Portions of the Greenhouse Superstructure	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Lumber and other materials available for making the repairs was properly utilized.		
2. Measurements were carefully taken before any materials were procured and cut.		
3. All materials procured were of proper size, type, and dimensions.		
4. All other work done was completed in the time allotted and met requirements for quality and durability.		
5. Necessary safety precautions were followed at all times in making the repairs.		
6. Tools, equipment, and left-over materials were properly cleaned and stored following use.		

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE REPAIRS

Module B: Greenhouse Repair and Maintenance

Task 6: REPLACE DAMAGED SECTIONS OF SARAN

Performance Checklist

1. Measure sections of damaged saran and cut necessary pieces of saran to replace worn or damaged area.
2. Stretch saran to allow for expansion and tack in place.
3. Secure saran by use of an overlay of lath or other materials to prevent tearing.
4. Return tools and materials to storage.

Test

Items Needed:
1. Greenhouse or shadehouse superstructure with sections of damaged saran or plastic cover
2. Saran or plastic
3. Scissors
4. Lath
5. Tacks
6. Tack hammer

Task: Replace the damaged sections of saran (or plastic cover).

Standard:
1. The sections of saran must be placed in such a way that they are attractive and functional. (They must provide the required amount of shading.)
2. The saran must be securely tacked.

Learning Activities

1. Attend a lecture-discussion on the function of saran in the greenhouse.

2. Answer and discuss these questions:

   a. Why is saran covering used on a greenhouse?
   b. Can a substitute be used? If so, what?
   c. How can you tell when saran is damaged and in need of replacement?
   d. Why must saran be attached securely to the greenhouse?
   e. Under what daylight or weather conditions would you replace saran?

3. Assist or watch a demonstration on replacing damaged sections of saran. Take notes of procedure and safety precautions.

4. Under the supervision of your instructor:

   a. Measure and mark saran for a repair to an area specified by the instructor.
   b. Cut the saran.
   c. Fit, stretch, and secure the saran, as directed by your instructor.
   d. Have your instructor check your work.

Student Competency Sheet

Duty VIII: MISCELLANEOUS MAINTENANCE AND REPAIRS

Module B: Greenhouse Repair and Maintenance

Task 7: REPLACE DAMAGED SUPPORT WIRES FOR SARAN OR BLACK CLOTH

Performance Checklist

1. Examine damaged greenhouse or shadehouse support wires to determine the length and number of wires requiring replacement.
2. Measure and cut wire for replacement.
3. Secure one end of each replacement to framework of greenhouse or shadehouse.
4. Stretch each wire to desired tightness and secure it.
5. Clean tools and return them and any unused materials to storage when the task has been completed.

Test

Items Needed:
1. Wire
2. Wire cutter
3. Pliers
4. Steel rule
5. Greenhouse with missing or damaged support wires

Task: Replace missing or damaged support wires for saran or black cloth.

Standard
1. Support wires must be securely fastened to the framework of the greenhouse.
2. Support wire must be tight enough to provide the necessary support without damaging the superstructures.

Learning Activities

1. Attend a lecture-demonstration on the uses of support wires in your school greenhouse. Discuss:
   - a. Where wires are placed.
   - b. How wires are secured.
   - c. Kind of wire used:
     - (1) Composition and coating (if any)
     - (2) Ply of wire (pound strength)
   - d. Condition of wire. (If it is frayed, what happens?)
   - e. What happens to plants which are exposed to full light because the shadecloth slipped or shifted or was damaged?

2. Watch a demonstration on the removal of damaged support wires in the greenhouse. Take notes of procedure and safety precautions.

3. Remove a damaged support wire, under the supervision of your instructor.

    a. Examine and discuss the damaged wire. Can any parts of the wire be salvaged?
    b. Would you recommend replacing the wire with the same kind?

4. Watch a demonstration on cutting and splicing wire.

5. Under the supervision of your instructor:

    a. Measure and cut a length of wire to repair or replace a wire, as assigned by the instructor.
    b. Splice the wire.
    c. Demonstrate to the class how to secure and stretch the support wire ends across the bench areas.
    d. Have your instructor evaluate your work.

DUTY IX

CONSTRUCTING GREENHOUSES AND STRUCTURES FOR ENVIRONMENTAL CONTROL

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Construct a greenhouse
- Construct a cold frame
- Construct a hot bed
- Construct a lath house

Student Competency Sheet

Duty IX: CONSTRUCTING GREENHOUSES AND STRUCTURES FOR ENVIRONMENTAL CONTROL

Module A: Greenhouse

Task 1: CONSTRUCT GREENHOUSE

Performance Checklist

1. Select a site for the greenhouse.
2. Sketch your design and list all specifications.
3. Pour the foundation.
4. Build the frame.
5. Install greenhouse covering material over frame.
6. Construct and treat benches.
7. Lay aisle floor coverings, such as flagstone or gravel.

Test

Items Needed:

1. Concrete blocks and cement or treated wood
2. Fabricated frame or pipe or laminated wood
3. Excavating equipment
4. Masonry tools
5. Assorted screws
6. Glass, plastic, or fiberglass covering material
7. Assorted tools

Task: Construct a greenhouse to given dimensions and design.

Standard: The structure will meet all specifications in the design.

Learning Activities

1. Read pp. 19-49, Flower and Plant Production and/or read pp. 18-22, Plant Propagation Principles and Practices and/or read pp. 11-30, Greenhouse Crop Production.

2. Attend a lecture-discussion on greenhouse design and construction.

3. Visit several greenhouses in your area. Discuss them with your class in terms of:

   a. Drainage
   b. Level site
   c. Natural, unshaded light
   d. Morning sun
   e. Water supply
   f. Access
   g. Design and function

4. Look at p. 15, Greenhouse Crop Production. Make a list of the major parts of a greenhouse.

5. Study the blueprints of a greenhouse.

6. Discuss the kinds of skills needed to build a greenhouse (carpentry, plumbing, etc.)

7. Discuss the "hidden costs" of building a greenhouse (building permit, insurance, mortgage financing, etc.).

8. Study the types of greenhouse structures shown in Information Sheet IX-A-1, "Types of Greenhouse Structures."

9. Select a site for a greenhouse. Draw a sketch of the greenhouse design you feel would be most appropriate to the site and your needs.

10. Draw a sketch of a design for a solar greenhouse on a home you are familiar with:

    a. Discuss your plans in terms of function and costs of the greenhouse.
    b. Discuss your plans in terms of necessary remodeling to the existing structure.

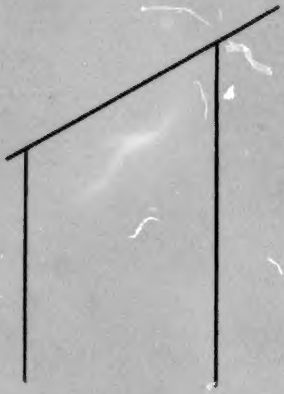
11. Visit the site of a greenhouse which is being built. Discuss your observations of site selection, function and design, materials, and work procedures and workmanship.

12. Work with your instructor to design and build a greenhouse or a model of a greenhouse.

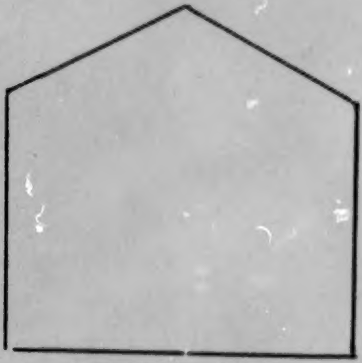
13. Select and discuss heating and watering systems for a greenhouse.

Information Sheet IX-A-1

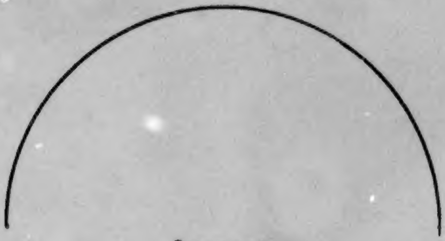
Types of Greenhouse Structures



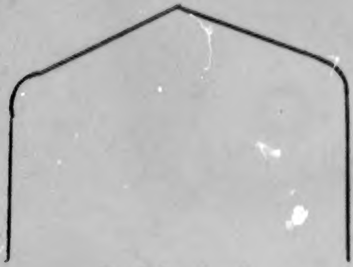
Lean-to



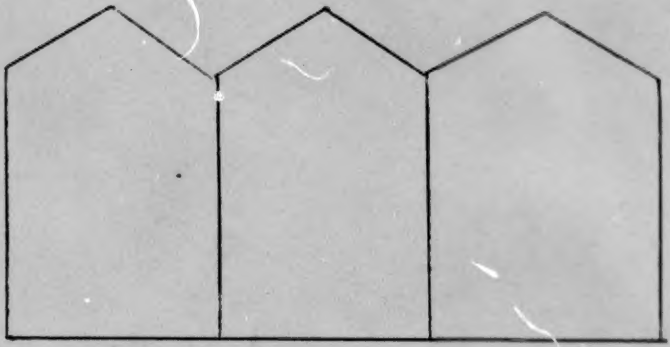
Freestanding



Quonset



Gothic Arch



Ridge & Furrow

Student Competency Sheet

Duty IX: CONSTRUCTING GREENHOUSES AND STRUCTURES FOR ENVIRONMENTAL CONTROL

Module B: Other Growing Structures

Task 1: CONSTRUCT COLD FRAME

Performance Checklist

1. Design a cold frame.
2. List materials needed for construction.
3. Lay out the site.
4. Excavate to depth specified in design.
5. Build frame following design specifications.
6. Fill frame with three (3) to five (5) inches of coarse aggregate.
7. Cover aggregate layer with four (4) to six (6) inches of sand.
8. Install sash.
9. Backfill around cold frame.
10. Clean work area and equipment.

Test

Items Needed:

1. Treated lumber or concrete blocks
2. Shovel
3. Hammer
4. Screwdriver
5. Saw
6. Nails
7. Screws
8. Coarse aggregate
9. Sand
10. Sash

Task: Construct a cold frame to a given dimension and design.

Standard: The structure will meet all design specifications.

Learning Activities

1. Read pp. 49-51, Flower and Plant Production and/or read pp. 24-25, Plant Propagation Principles and Practices and/or read p. 20, Greenhouse Crop Production.

2. Attend a lecture-discussion on the function and design of cold frames.

3. Discuss: The cold frame is an ideal place to harden plants before they go outdoors.

4. Study and discuss Information Sheet IX-B-1, "Cold Frame Design."

5. Answer and discuss these questions:

   a. When is the best time of year to build a cold frame?
   b. Does it matter which direction the cold frame faces?
   c. Why must the floor of the cold frame be level?
   d. Why should the base of the cold frame extend down into the soil at least seven (7) to 11 inches below ground level?
   e. What function do the sand and coarse aggregate serve?

6. Experiment:

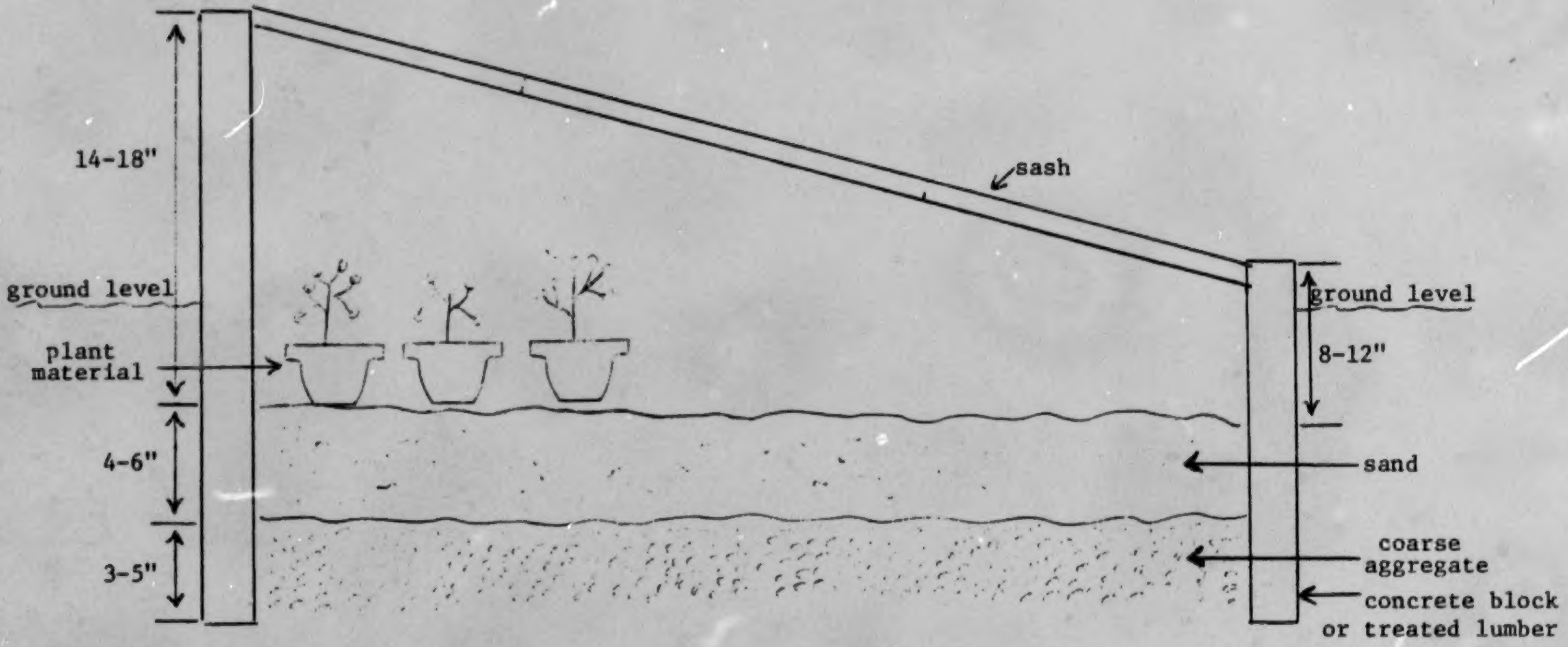
   a. Set three (3) four-inch (4") pots of Easter lilly bulbs in a cold frame in early September.
      (1) Keep the cold frame temperature above freezing.
      (2) About mid-December, transplant the lilies to six (6) inch pots.
      (3) Move the pots into 60° temperature.
   b. At the same time you set the lilies into the cold frame, place a single four (4) inch pot of Easter lily bulbs in 35° storage.
      (1) Move the plant to a six (6) inch pot at the same time you move your cold frame plants.
      (2) Keep this pot in 35° storage.
   c. When it is marketing time for Easter lilies, compare the differences in growth between the cold frame plants and the plant developed in 35° storage.

7. With a small group, design a cold frame. Draw the plans and discuss them with your instructor.

8. With a small group and under the supervision of your instructor, build a cold frame. Your instructor will demonstrate safe procedures.

Information Sheet IX-B-1

Cold Frame Design


14-18"
ground level
plant material
4-6"
3-5"
sash
ground level
8-12"
sand
coarse aggregate
concrete block or treated lumber

Student Competency Sheet

Duty IX: CONSTRUCTING GREENHOUSES AND STRUCTURES FOR ENVIRONMENTAL CONTROL

Module B: Other Growing Structures

Task 2: CONSTRUCT HOT BED

Performance Checklist

1. Select a hot bed site.
2. Design a hot bed.
3. List materials needed for construction.
4. Excavate to depth specified in design.
5. Construct the hot bed frame.
6. Place four (4) to six (6) inches of coarse aggregate into the hot bed.
7. Cover aggregate layer with two (2) to three (3) inches of sand.
8. Install soil heating cables.
9. Cover cables with four (4) to six (6) inches of soil or growing medium.
10. Install sash.
11. Backfill around hot bed.
12. Clean area and equipment.

Test

Items Needed:

1. Treated lumber or concrete blocks
2. Lead or plastic coated soil heating cables
3. Thermostat
4. Shovel
5. Hammer
6. Screwdriver
7. Saw
8. Nails
9. Screws
10. Sash
11. Coarse aggregate
12. Sand

Task: Construct a hot bed to the given dimensions and design.

Standard:

1. The structure will meet all design specifications.
2. The structure will maintain the desired temperature to within two (2) degrees.

Learning Activities

1. Read pp. 22-24, Plant Propagation Principles and Practices and/or read pp. 48-50, Greenhouse--Place of Magic.

2. Attend a lecture-discussion on the function and design of a hot bed.

3. Study Information Sheet IX-B-2, "Hot Bed Design":

    a. Discuss the design.
    b. What is "soil heating cable?"
    c. What is the purpose of the thermostat? Why is it located on the low side of the hot bed?

4. With the help of your instructor, work with a small group to design and locate a hot bed, or convert a cold frame into a hot bed.

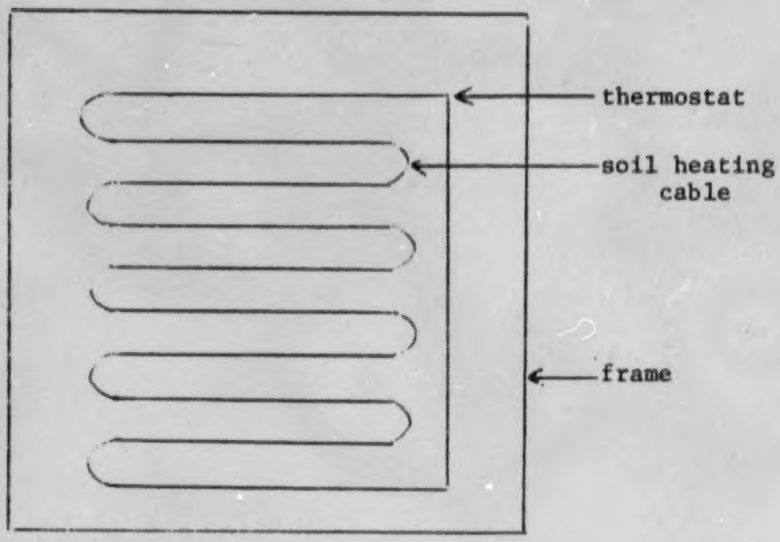
5. Under the supervision of your instructor, convert a cold frame into a hot bed by adding a small electric heating unit or electric cables. Your instructor will demonstrate safe procedures.

6. Experiment:

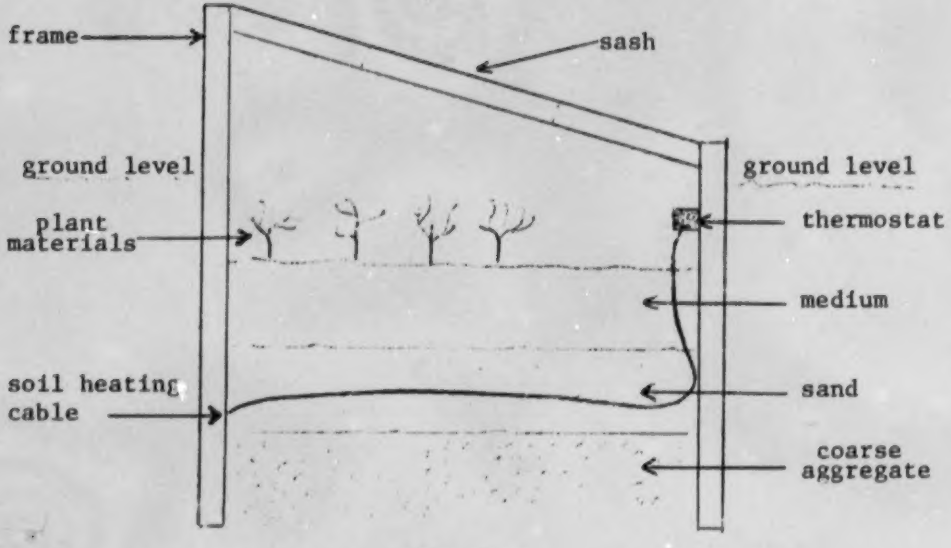
    a. Store six (6) pots of planted bulbs in a hot bed until they have rooted. Then bring them into the greenhouse.
    b. Store six (6) other pots of planted bulbs in the greenhouse until they have rooted.
    c. Compare the two groups of plants. Discuss your observations.

Information Sheet IX-B-2

Hot Bed Design


thermostat
soil heating cable
frame

top view


frame
sash
ground level
ground level
plant materials
thermostat
medium
soil heating cable
sand
coarse aggregate

side view

Student Competency Sheet

Duty IX: CONSTRUCTING GREENHOUSES AND STRUCTURES FOR ENVIRONMENTAL CONTROL

Module B: Other Growing Structures

Task 3: CONSTRUCT LATH HOUSE

Performance Checklist

1. Draw plans for a lath house.
2. List materials needed for construction.
3. Drive posts into ground to a depth of 24 inches.
4. Cement a six (6) inch collar around each post.
5. Construct a support frame around post.
6. Nail lath to support frame.

Test

Items Needed:

1. Posts of pipe
2. Concrete
3. Framing lumber
4. Lath or snow fence
5. Nails
6. Hammer
7. Saw
8. Shovel

Task: Construct a lath house to the given dimensions and design.

Standard: The structure will meet all specifications in the design.

Learning Activities

1. Read pp. 25-26, Plant Propagation Principles and Practices and/or read pp. 20-21, Greenhouse Crop Production.

2. Attend a discussion on the function and design of a lath house.

3. Answer and discuss these questions:

    a. What is lath?
    b. What is another name for a lath house?
    c. What is a lath house used for?
    d. Why must the framework of a lath house be well constructed and securely anchored?

4. Study Information Sheet IX-B-3, "Lath House Design":

   a. Design a lath house:
      (1) Draw a sketch
      (2) Draw plans
      (3) Write specifications
      (4) Write a supply order

   b. Your instructor will discuss your work with you.

5. Watch a demonstration on how to construct a lath house. Take notes of procedures and safety precautions.

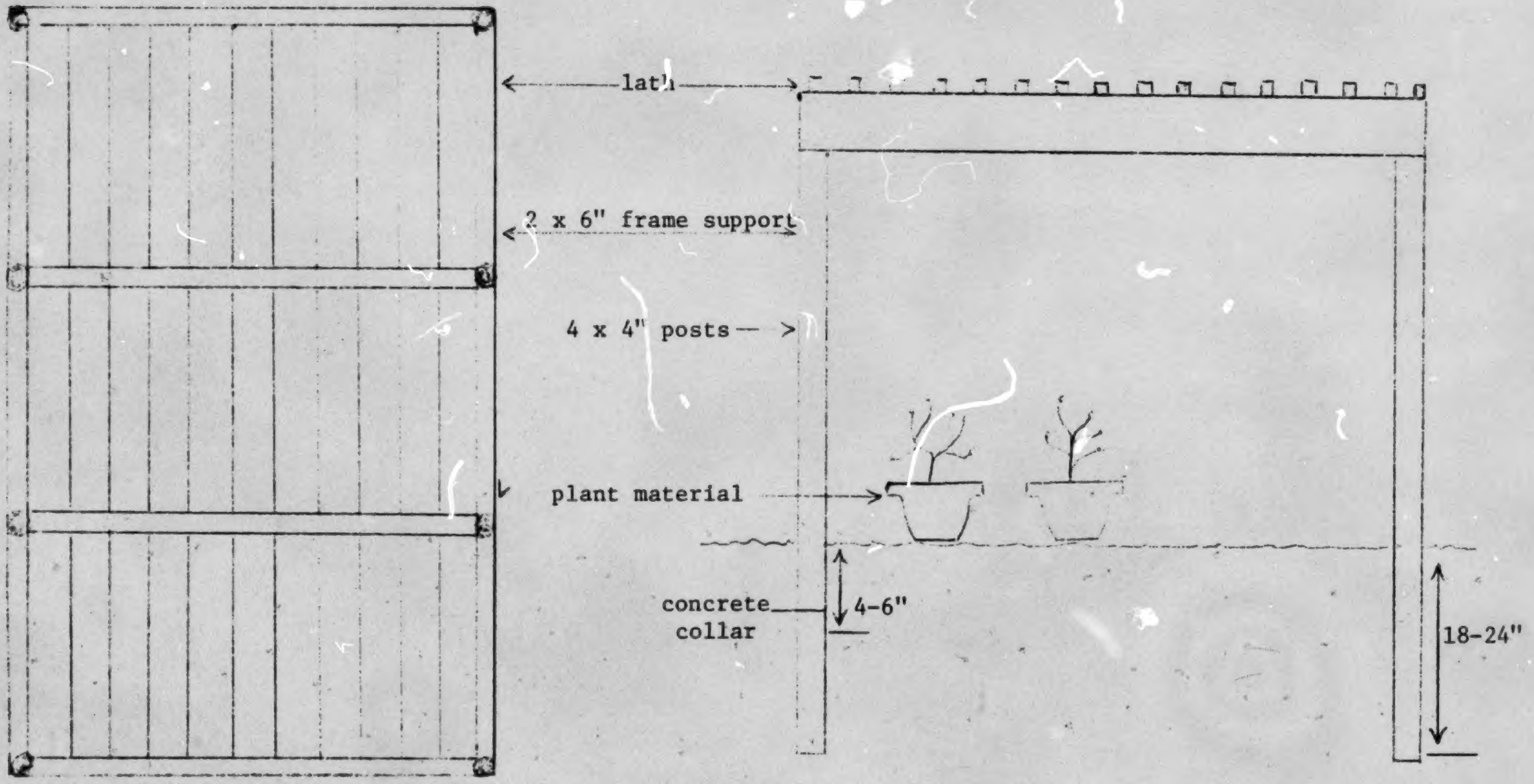
6. Help your instructor construct a lath house.

7. Under the supervision of your instructor, work with a partner or as a small group to:

   a. Select a site for a lath house.
   b. Draw plans for a lath house (or use plans provided by your instructor).
   c. Order and assemble the materials and tools.
   d. Sink and cement posts.
   e. Build a framework.
   f. Nail laths to posts and supporting boards.
   g. Have your instructor check your work.

Information Sheet IX-B-3

Lath House Design


lath
2 x 6" frame support
4 x 4" posts
plant material
concrete collar
4-6"
18-24"

top view

side view

DUTY X

SELECTING PLANT MATERIALS FOR RETAILING

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Select cut flowers
- Select cut foliage
- Select flowering plants
- Select foliage plants

Student Competency Sheet

Duty X: SELECTING PLANT MATERIALS FOR RETAILING

Module A: Cut Materials

Task 1: SELECT CUT FLOWERS

Performance Checklist

1. Check stem length from flower head to main stem.
2. Turn flower head upside down; check for wilt.
3. Check size of flower head.
4. Test firmness of flower head.
5. Check for presence of broken flower heads.
6. Choose a variety of head sizes for preparing arrangements.
7. Select flower colors and types, according to seasonal needs and vase life.

Test

Items Needed:	1. Cut flowers, such as mums, roses and carnations 2. Containers
Task:	Select cut flowers for retailing.
Standard:	1. Flowers selected must be fresh. 2. There must be a variety of head sizes. 3. Stems must be long enough to be used in all types of arrangements to avoid waste.

Learning Activities

1. Read pp. 24-32, Retail Flower Shop Operation and Management.

2. Discuss:

   a. The most popular varieties of cut flowers for spring sales.
   b. The most popular varieties of cut flowers for fall sales.

3. Visit a retail florist. Observe the variety of floral stock in the shop. Find out (and take notes):

   a. Where the flowers were bought.
   b. How they were delivered.
   c. What arrangements were made to pay the wholesaler.
   d. Costs of the flowers in stock. (How much did the florist pay? What will the customer pay?)
   e. How the florist decided what kind and how many of each kind to buy.
   f. How often new stock is ordered.

4. Visit a wholesale florist. Find out (and take notes):

   a. How many customers (in how large an area) the wholesaler serves.
   b. The wholesaler's sources of flowers; how they were delivered.
   c. How much the wholesaler must pay for various kinds of flowers.
   d. How the wholesaler decided what kind and how many of each kind to buy.
   e. How the wholesaler decides what to charge the retailer.
   f. What becomes of stock that does not sell for prime prices.

5. With your class, compare the notes you took on the visits to the floral shop (retailer) and the wholesale florist. Discuss:

   a. How the costs of the flowers compared: to the wholesaler, to the retailer, to the customer.
   b. What is the percent increase in cost at each step from grower to wholesaler to florist to customer?
   c. What happens to profits if the wholesaler orders too much stock? If the retail florist orders too much stock?
   d. How many days or hours were there between the time the grower cut the flowers and the retail florist sold them?

6. Discuss: Flowers with short stems have limited use in arrangements and make the cost of each flower too high.

7. Practice selecting cut flowers. Answer the questions as you make the selections:

   a. Carnations:
      (1) Are the heads firm or soft?
      (2) Is the calyx split?
      (3) Is the foliage fresh, or is it slimy, soggy, or limp?
   b. Roses:
      (1) Is the bud just beginning to open, or is it too tight?
      (2) Is the head soft, or is it open too far?
      (3) Does the foliage crinkle or crumble when squeezed?
   c. Poms or mums:
      (1) Is the stem length (from flower head to main stem) long enough to be able to use most of the flower heads in arrangements?
      (2) Are the flower heads broken or soft?
      (3) Are there signs of wilt?

8. With your instructor, work out the cut-flower needs of one day for a floral shop. Consider the orders to be filled for the day and the off-the-street sales you can anticipate. Then:

   a. Decide how many of each kind of flower you will need to buy from the wholesaler.
   b. Purchase the flowers you will need:
      (1) Place a telephone order for any stock not available locally.
      (2) Visit the "wholesaler" and select flowers.
   c. Your instructor will evaluate your performance.

Student Competency Sheet

Duty X: SELECTING PLANT MATERIALS FOR RETAILING

Module A: Cut Materials

Task 2: SELECT CUT FOLIAGE

Performance Checklist

1. Inspect cut foliage for the following:
   a. Freshness of color
   b. Drooping, limp leaves
   c. Slime, mildew or decay
   d. Firmness
   e. Dry, crumbling leaves
2. Select type of foliage according to intended use in arrangement as line or fill material:
   a. Pittisporum - filler
   b. Scotch Broom - line
   c. Baker Fern - line and fill
   d. Tike - line and fill
   e. Ti leaves - line
   f. Eucalyptus - line

Test

Items Needed: Several varieties of cut foliage

Task: Select cut foliage for arrangements or bunch sales.

Standard:
1. Cut foliage selected must be fresh.
2. There must be no broken leaves or other defects which would reduce its salability.

Learning Activities

1. Read pp. 47-52, Retail Flower Shop Operation and Management.

2. Discuss:

   a. Why foliage is used.
   b. The range of types of foliage used for line arrangements.
   c. The range of types of foliage used for filler.
   d. What qualities the different types of foliage have that help you decide what to use.

3. Obtain three (3) varieties of cut foliage from your instructor. Check the foliage for the following:

   a. Leaf color
   b. Stem rot
   c. Firmness

4. Using the manual, Retail Flower Shop Operation and Management, match your three (3) types of cut foliage with the cut flowers listed on pp. 24-32. Answer the following questions:

   a. Which foliage would be best to combine with roses?
   b. Which foliage would work well with Fuji chrysanthemums?
   c. Which foliage would be appropriate with Easter lilies?
   d. Which one of your foliage samples would work well with poms?
   e. Which foliage works best with miniature carnations?
   f. Which variety of foliage would you use in a gladiola arrangement?

5. Draw sketches of six (6) kinds of foliage used for line and fill.

   a. Label them by common name and botanical name.
   b. Where, and under what conditions is each one grown?
   c. Trace the transportation needed for each, from grower to florist.
   d. What is the expected life of each kind? (How long can the florist keep a shipment before its salability has passed?)

6. With your instructor, work out the foliage needs of one day for a floral shop. Consider the orders to be filled for the day and the off-the-street sales you anticipate. Then:

   a. Decide how much or many of each kind of foliage you will need to buy.
   b. Purchase the foliage you will need:
      (1) Place a telephone order for any stock not available locally.
      (2) Visit the "wholesaler" and select foliage.
   c. Your instructor will evaluate your performance.

Student Competency Sheet

Duty X: SELECTING PLANT MATERIALS FOR RETAILING

Module B: Potted Plants

Task 1: SELECT FLOWERING PLANTS

Performance Checklist

1. Check growth stage of the plant.
2. Compare present size of plant with model size for particular stage of development.
3. Count number of blooms on plant.
4. Inspect condition of foliage for freshness.
5. Check underside of flowers for decay.

Test

Items Needed:	Several varieties of flowering plants, such as chrysanthemums, poinsettias, African violets, geraniums.
Task:	Select flowering plants for retail sale.
Standard:	1. Plants selected should have several flowers in bud and one or two flowers in bloom so that customers can see what the plant will look like in full bloom. 2. Plant foliage must be fresh and disease-free. 3. Several pot sizes must be selected to offer a range of prices for customers.

Learning Activities

1. Read pp. 13-37, Retail Flower Shop Operation and Management.

2. Answer the following questions:

   a. What colors are poinsettias available in?
   b. What season of the year are poinsettias most popular?
   c. With appropriate care, how long will an African violet bloom?
   d. How are prices determined for Easter lilies?
   e. How are prices determined for potted chrysanthemums?
   f. When are daffodils most abundant?
   g. What are three flowering potted plants suitable for hospital arrangements?
   h. What plants are most popular for Mother's Day sales?

3. Select five (5) different flowering plants.
    a. Study them carefully in terms of shape, leaves, buds, flowers, and any special characteristics.
    b. Record your findings on the Plant Observation Sheet (Information Sheet X-B-1).

4. When you have completed the Plant Observation Sheet, cover the "NAME" column and give your sheet to another student to identify the plants that you have sketched and described.

5. With your instructor, work out the kinds and numbers of flowering plants you expect to sell in one week or during a selling season (Easter, Mother's Day, etc.):
    a. Determine how much space you have in your shop to store the plants.
    b. Determine how much space you have in your shop to display plants.
    c. Determine how many of each kind of plant you will order; determine sizes to be ordered.
    d. Purchase the plants:
        (1) Place a telephone order for any flowering plants not available locally.
        (2) Visit the "wholesaler" or greenhouse to select plants.
    e. Your instructor will evaluate your performance.

6. Find cut and discuss:
    a. How much the various sizes and kinds of plants will cost the retailer.
    b. How much the retailer will charge the customer.
    c. What was the percentage mark-up?
    d. What was the profit?
    e. How much loss can be expected from plants that do not sell? That were damaged? That died or drooped or lost blooms?
    f. What must the retailer do to insure against plant loss?

Information Sheet X-B-1

Select Flowering Plants

PLANT OBSERVATION SHEET

Directions:

a. In SHAPE column..............Sketch an outline of the shape of your plant's flower.
b. In LEAVES column.............Sketch the shape of the plant's stem and leaves.
c. In BUDS column...............Sketch the shape of your plant in the bud stage (before it is fully open).
d. In FLOWER column.............Write the color and size (in inches of the diameter) of the flower head.
e. In SPECIAL FEATURES column...List any special characteristics that make your plant easy to identify, such as speckled leaves, thorns, hairy leaves, etc.
f. In NAME column...............Write your plant's common name and variety (for example: daffodil, King Alfred)

SHAPE	LEAVES	BUDS	FLOWER	SPECIAL FEATURES	NAME

Student Competency Sheet

Duty X: SELECTING PLANT MATERIAL FOR RETAILING

Module B: Potted Plants

Task 2: SELECT FOLIAGE PLANTS

Performance Checklist

1. Inspect plant foliage for the following:
   a. Fresh color
   b. Firm, pliable leaves which do not crumble when touched
   c. Stem rot, mildew, or decay
   d. New growth
   e. Full, bushy plants that are not weak and spindly
   f. Presence of mites and other insects on underside of leaves

Test

Items Needed: A selection of foliage plants, as available in the floral laboratory

Task: Select foliage plants for retailing.

Standard:
1. Plants selected must be of table and floor heights to meet a variety of decorative uses.
2. Plants selected should require varying amounts of light to meet customers' needs.

Learning Activities

1. Read pp. 38-52, Retail Flower Shop Operation and Management.

2. Look at a variety of magazines, both professional and home-decorating. Discuss:

   a. What has happened in recent years to the idea of decorating with plants.
   b. What kinds of plants are being used for decorating. How are they used?
   c. Which and how many of the plants in the magazines you would be likely to stock in a retail greenhouse or floral shop.

3. Visit a shop or greenhouse which retails a large variety of foliage plants:

   a. What are their best-selling plants?
   b. How many of these are sold in more than one pot size?
   c. At what stage do they transfer plants from pots to hanging baskets?
   d. Which plants are suitable for hanging baskets? Which are not suitable for hanging baskets? Why?

4. Make a list of foliage plants in your school greenhouse. Then make a chart:

    a. List the common name and the botanical name for each.
    b. Draw a sketch of each.
    c. For each plant on the list, describe the color and texture of a healthy plant.
    d. Estimate the selling price for the kind of plant and pot size. (On what did you base your estimate?)

5. Experiments:

    a. Insert a piece of decorative bark into a large potted ivy (to encourage the plant to grow upward rather than to trail).
    b. Make an arrangement of seven potted plants of the same kind and size. Compare the appearance to an arrangement made of seven (7) potted plants of assorted kind and size.
    c. Choose three varieties of small, potted plants which show new growth:
        (1) How long will it take the new growth to develop into leaves?
        (2) How many weeks before your plants must be re-potted?

6. Role-play:

Mr. and Mrs. Alias Smith-Jones are interior decorators. They want to buy plants for their customers. They need:

a. Three (3) large, tree-like foliage plants for floor decoration at the grand opening of a new office building.
b. Three (3) trailing plants for use in a long, low planter on a fireplace mantle in the summer or on a coffee table in the winter.
c. Three (3) foliage plants for a basement apartment, where there is low-light intensity.

Recommend and identify plants in your "shop" that will meet their needs. Point out your reasons for recommending these plants. Your instructor will evaluate your selection.

DUTY XI

PROLONGING THE USEFULNESS OF PLANT MATERIALS

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Condition cut flowers and foliage
- Store cut flowers to prolong their usefulness
- Inspect potted plants for pests and damage
- Provide environmental care for potted plants

Student Competency Sheet

Duty XI: PROLONGING THE USEFULNESS OF PLANT MATERIALS

Module A: Cut flowers

Task 1: CONDITION CUT FLOWERS AND FOLIAGE

Performance Checklist

1. Clean and rinse containers which will be used for holding flowers.
2. Add warm water and floral preservative (optional) to the containers (80° to 100°).
3. Clean and sterilize cutting tools, wiping dry if water is used.
4. Condition soft-stemmed flowers:
   a. Use a sharp floral knife to make a slanting cut just above a leaf node or eye of flower stem.
   b. Remove all leaves from the stems which will be below water level when flowers are placed into cut flower container.
   c. Place flowers into containers.
   d. Place filled containers out of the way in workroom. Give flowers sufficient time (two (2) hours) to complete conditioning process before using.
5. Condition woody-stemmed flowers:
   a. Cut woody-stemmed flowers to container size with pruning shears, if necessary.
   b. Split or pound the ends of stems.
   c. Place flowers in a container of warm water containing floral preservative.
   d. Place containers out of the way in workroom. Allow flowers to condition for a minimum of two (2) hours.
6. Condition flowers whose stems secrete a milky-like sap:
   a. Use a sharp floral knife to make a slanting cut at stem end of flower.
   b. Shear; then place cut end of flower in hot water or wood alcohol.
   c. Place flowers in a container of water containing floral preservative.
   d. Place filled containers in an out-of-the-way location in workroom. Allow at least two (2) hours for flowers to complete the conditioning process.

Test

Items Needed:
1. Soft-stemmed flowers or foliage
2. Woody-stemmed flowers or foliage
3. Sap-producing flowers or foliage
4. Containers
5. Floral preservative
6. Floral knife

7. Pruning shears
8. Alcohol or heat source for searing ends of flowers that secrete milky sap
9. Hammer
10. Water
11. Detergent and disinfectant

Task: Condition cut flowers and foliage.

Standard:
1. Soft-stemmed flowers:
   a. Must be cut on a slant
   b. All leaves below water level must be removed
   c. Blooms should be turgid
2. Woody-stemmed flowers:
   a. Stems must be shredded
   b. All leaves below water level must be removed
   c. Blooms should be turgid
3. Sap-producing stems:
   a. Stems should be free of flowing sap
   b. All leaves below water level must be removed
   c. Blooms should be turgid

Learning Activities

1. Read Module FD-4, Retail Flower Shop Salesperson and Floral Designer.

2. Discuss with your class:

   a. For what plants and under what conditions would you add a preservative to the water?
   b. What kinds of floral preservatives are most commonly used?
   c. How do the preservatives act on the cut flowers/foliage to prolong life?
   d. How does hot water or wood alcohol condition sap-producing stems?
   e. Why is a slanting cut made?
   f. Why is the cut made above a leaf node or eye of flower stem on soft-stemmed flowers?
   g. Why are ends of woody-stemmed flowers split or pounded? How far up the stem should you pound?
   h. Why should flowers/foliage be placed in water which is between 80° and 100° temperature?
   i. Why do you not remove any leaves from soft-stemmed flowers grown from bulbs?

3. Select the following plants and condition them:

   a. Six (6) poms or gladiola
   b. Six (6) daffodils, tulips, or narcissus
   c. Six (6) mums, lilacs, and/or forsythia branches
   d. Five (5) poinsettias or dahlias
   e. Five (5) of each of four (4) foliage plants, as assigned by your instructor.

4. Have your instructor evaluate your work, in terms of:

   a. The procedure you used to condition the flowers and foliage.
   b. The type of preservative you used for each.

Student Competency Sheet

Duty XI: PROLONGING THE USEFULNESS OF PLANT MATERIALS

Module A: Cut flowers

Task 2: STORE CUT FLOWERS

Performance Checklist

1. Inspect storage cooler for clean windows, floor, and interior and exterior walls.
2. Read cooler thermometer for recommended temperature range of 40-44°.
3. Check humidity level in cooler, which should be high enough to prevent flowers from drying out without causing mold or mildew.
4. Turn cooler lights on.
5. Cull flowers to remove any defective matter.
6. Stock cooler with each type of flower in clean, separate container.
7. Leave sufficient space between containers to allow air to circulate.
8. Arrange containers attractively in cooler to encourage customers to buy.

Test

Items Needed:
1. Display or storage cooler
2. Thermometer
3. Clean containers
4. Cut flowers

Task: Store cut flowers in display and storage coolers.

Standard: Cut flowers must be stored in cooler which provides safe temperature, humidity, light, ventilation, and sanitary conditions to prevent bacteria formation and loss of flowers.

Learning Activities

1. Attend a lecture-discussion and review:
   a. Temperature ranges and control for effective storage.
   b. Humidity ranges and control for effective storage.
   c. Function of cooler lights. What wattage is recommended?
   d. Storage life of cut flowers and foliage.

2. Investigate and discuss cleaning agents and methods for:

   a. Windows
   b. Cooler floor (wood, tile, asbestos, etc.)
   c. Interior walls (painted, galvanized, etc.)
   d. Exterior walls (wood, painted, metals, etc.)
   e. Containers

3. Demonstrate how to clean a storage cooler with detergent and water.

4. Demonstrate how to clean storage containers with detergent and bleach. Explain:

   a. Safety precautions for using bleach.
   b. Why do you apply bleach to containers?
   c. What happens to flowers/foliage stored in containers which are not clean?

5. Arrange several containers of conditioned flowers and foliage in a cooler. Your instructor will evaluate how well you have arranged them for:

   a. Maximum eye appeal
   b. Adequate air circulation

Student Competency Sheet

Duty XI: PROLONGING THE USEFULNESS OF PLANT MATERIALS

Module B: Potted Plants

Task 1: INSPECT POTTED PLANTS FOR PESTS AND DAMAGE

Performance Checklist

1. Examine potted plants daily for insect and/or fungus damage.
2. Remove insects by hand with toothpick or tweezer if number of insects is small.
3. Wash broad-leafed plants with soapy water to remove mild infestations.
4. Handpick aphids and mealybugs by touching them with alcohol-soaked cotton swab.
5. Apply fungicide sprays for out-of-control infestation, in accordance with container instructions.
6. Cut off or handpick diseased leaves and destroy.

Test

Items Needed:
1. Insecticide sprays
2. Tweezers
3. Protective gloves
4. Toothbrush or sponge
5. Rubbing alcohol
6. Cotton swabs

Task: Examine potted plants for presence of pests, fungus, and other damage.

Standard:
1. Insects and fungus must be removed completely to avoid further damage.
2. Diseased plants must be removed and isolated to prevent damage to healthy plants.

Learning Activities

1. Read and discuss the following sections in Introductory Horticulture; answer the questions at the end of each chapter:

   a. "Pesticides," pp. 182-192
   b. "Insecticides," pp. 193-206
   c. "Fungicides, Rodenticides, Molluscicides, and Nematocides," pp. 207-214

2. Look at the series of slides on Insect Identification (California State Polytechnic College):
   a. As you look at the slides, refer to Information Sheet XI-B-1, "Plant Ailment Chart."
   b. Match the information on the chart to the information on the slides.
   c. Discuss what you have seen.

3. Attend a lecture-demonstration on how to identify and treat plant damage caused by environmental conditions and fungi. Discuss:
   a. How this damage differs in appearance from damage caused by insects.
   b. Fungus diseases which infect plants.
   c. How much plant growth must be removed from infected plants.
   d. How to remove damaged leaves and stems.
   e. How to destroy diseased plant parts which have been removed.

4. Attend a lecture-discussion on insects. Discuss:
   a. Conditions which encourage the insect pests to grow.
   b. Insects which are beneficial to plants.
   c. Prevention of insect infestation.
   d. Care of the plant while removing insects by hand.
   e. Disposal of insects removed by hand.

5. Your instructor will assign a fungus for you to study:
   a. Investigate your assigned fungus. (Look in the library for government publications, chemical manufacturers' bulletins and brochures, etc.)
   b. Give an oral report to your class.
      (1) Describe the fungus.
      (2) Show an example of the fungus.
      (3) Tell how to prevent the fungus (conditions that will help to deter it).
      (4) Tell how to treat the fungus.

6. Attend a lecture-discussion on application of insecticides and fungicides. Take notes of procedures and safety precautions. Discuss:
   a. Trade names and chemical contents of insecticides and fungicides.
   b. The chemical actions/reactions which rid plants of insects and fungi.
   c. What happens to plants if insecticides and fungicides are not applied correctly.
   d. Review the precudure and safety precautions for filling and using a spray applicator.

7. Your instructor will help you identify plants that must be treated. Under the supervision of the instructor:
   a. Demonstrate how to remove insects by hand-picking methods.
   b. Demonstrate how to wash broad-leafed plants.
   c. Demonstrate how to spray-treat plants.
   d. Demonstrate how to remove diseased leaves.

8. Examine damaging insects under a microscope. Then make a chart:
   a. Draw sketches of the insects.
   b. Identify the insects by common and entomological names.
   c. Identify plants which host these insects.
   d. Identify the kinds of damage that each of these insects does to plants. (What are the signs of infestation?)

9. Under a microscope, compare an insect pest which has been sprayed with insecticide with one which was not sprayed. Discuss your observations.

10. Select ten (10) potted plants which show signs of disease or pest infestation:
    a. Identify each by:
       (1) Common name
       (2) Botanical name
       (3) Type of ailment
    b. Write a report describing the pests or damage:
       (1) Describe the extent of the damage.
       (2) Describe the cause of the damage.
       (3) Describe the recommended remedy or treatment.
    c. Under the supervision of your instructor, treat the affected plants.
    d. Discuss your performance with the instructor.

11. Visit a greenhouse, floral shop, or a neighbor who has a large plant collection. Look for signs of insect or fungus or environmental damage.
    a. Make a list of damaged plants, by name and pot size.
    b. Find out the retail value of each plant.
    c. Estimate the cost of replacing the plants.
    d. Estimate the dollar cost to a retail florist or grower in terms of:
       (1) Plant treatment (materials and labor)
       (2) Possible losses due to spread of the ailment to other plants
       (3) Lost sales
    e. Review your report with the instructor.

Information Sheet XI-B-1

PLANT AILMENT CHART

Pest or Symptom	Description	Remedy
Insects:		
Ants	Black, red, brown, yellow; 1/16" - 1/2"; burrow in roots or crawl on plants.	Use Insecticide Spray
Aphids	Green, pink or black; 1/16" - 1/8" long; winged or wingless; powdery or wooly-looking with waxy covering; cluster under leaves or tips of new leaves, stems, or flower buds; excrete sticky liquid on plant; stunt growth, curl and distort leaves.	Use Insecticide Spray
Caterpillars, Cutworms, Leafrollers	Green or brown, multicolor, black, solid color, striped, banded, mottled; 1-1/2" - 2"; dark pellets of excrement on plant; leafrollers make tent, destroying plant within; leaves, flowers, and buds eaten or plant cut off at soil level.	Handpicking. If cutworms hide in soil, spray with malathion or rotenone.
Maggots	White; wormlike, immature forms in soil; 1/4"; feed on roots, crown; foliage loses or changes color; plant growth stunted.	Drench soil with chlordane or malathion
Mealybugs	Waxy, dusty white; 3/16" or less; cluster on leaf and stem junctures, along veins or under leaves where they lay waxy eggs, suck plant juices; excrete "honeydew" similar to that of aphids.	Dab bug with cotton swab dipped in rubbing alcohol.
Millipedes, Centipedes	Wormlike with many short legs; gray, brown, tan; 1-1/2" or less; hide under pots in damp places; feed on seeds, roots, bulbs, fleshy stems, tubers.	Use Insecticide Spray

PLANT AILMENT CHART (continued)

Pest or Symptom	Description	Remedy
Scale	Mostly brown, gray; hard; round or oval; 1/16" - 1/8"; egg sacks can be mistaken for mealybugs; infect leaves, stems; stunt growth; excrete honeydew.	Handpick if few present, or use mild soap solution and toothbrush to loosen and remove.
Sowbugs	Brown, gray; oval, segmented, shell-like bodies; 1/4" - 1/2"; found under pots, on shelves, and in loose soil during daylight hours; feed on roots, seedlings, tender plant parts.	Spray with insecticide, such as chlordane or malathion
Spider mites	Green, red or yellowish; almost invisible; oval-shaped; gather under leaves before spreading; form web on plant with speckled leaf areas, especially on under side of leaves; leaves brown; stunted growth, faded flowers.	Use Insecticide Spray
Springtails	Range from white to blue or purple or black; slim, segmented body or globular shape; almost invisible to 1/5"; dwell on soil surface in damp areas; chew tender plants and seedlings near soil level.	Spray with chlordane or malathion.
Thrips	Black, tan or brown with light markings; almost invisible; young specimens are white, yellow or orange; adult species may fly, leap or run; leave white streaks on leaves; streak or distort flowers; blotchy leaves.	Spray with insecticide, such as malathion.
Whiteflies	Young specimens are pale green to yellow and scale-like, about 1/16" in size; oval-shaped and flat-topped; adults show white wedge-shaped wings; suck plant juices and excrete honeydew, yellow and dropped leaves.	Spray with insecticide, such as malathion.

PLANT AILMENT CHART (continued)

Pest or Symptom	Description	Remedy
Damage:		
Black leaf	May indicate advanced stages of disease or infestation, but generally caused by frost and freezing temperatures.	Spray with insecticide or eliminate freezing conditions.
Brown-tipped leaves	Caused by either overfeeding, over- or under-watering, or improper temperature or humidity.	Adjust feeding and environmental conditions according to species.
Gray mold blight	Flowers, buds, stems, and leaves rot under cover of gray mold; brownish-black leaves, caused by botrytis fungus.	Remove and destroy infected plant parts; maintain dry leaves and avoid over-watering or over-fertilizing. Provide sufficient air space around plant. If no improvement, spray with fungicide, such as ferbam or zineb.
Leaf drop	Leaves withered and fallen from plant due to improper watering, feeding, temperature, or lighting conditions.	Adjust environmental conditions according to plant species.
Leaf rot	Punctured or rotting leaves caused by nematodes fungus.	Remove damaged leaves and destroy them.
Leaf spot	Spots of various sizes and intensity appear on leaves, sometimes becoming blotches; leaves wither and die from this fungus.	Cut off infected leaves and do not water foliage; isolate infected plants for better air circulation and less humidity.
Lower leaf drop	Yellowish or dropped lower plant leaves caused by lack of nitrogen, overwatering, incorrect temperature or light.	Adjust environmental conditions according to plant species.
Spindly growth	Improper environmental conditions discourage new growth.	Adjust environmental conditions according to plant species.

PLANT AILMENT CHART (continued)

Pest or Symptom	Description	Remedy
Stem rot	May indicate presence of disease or merely overwatering or bruising.	Water less frequently, and isolate plant to prevent possible spread of disease.
White, encrusted soil on surface or pot rim	Excess salt from hard water or fertilizer.	If hard water is the cause, allow water to stand in container a few days before applying to plant so that mineral content in water will settle. If fertilizer is the cause, drench plant to leach salt from pots and repeat this process two to three times in succession; wash salts from rims of clay pots.

Student Competency Sheet

Duty XI: PROLONGING THE USEFULNESS OF PLANT MATERIALS

Module B: Potted Plants

Task 2: PROVIDE ENVIRONMENTAL CARE FOR POTTED PLANTS

Performance Checklist

1. Repot plants according to drainage and root-spread requirements.
2. Adjust temperature or move plants according to temperature requirements.
3. Water potted plants according to requirements for each species.
4. Mist plants which require high humidity level.
5. Expose potted plants to lighting conditions required for optimum growth.
6. Clean dusty foliage.
7. Fertilize potted plants at intervals recommended for each species.

Test

Items Needed:

1. Water
2. Humidifier
3. Mist sprayer
4. Wipe cloth
5. Cotton swabs or balls
6. Soft brush
7. Sponge
8. Mild soap
9. Thermometer
10. Potting soil and sand
11. Drainage stone or crock
12. Pots (assorted)
13. Spagnum moss
14. Peat moss
15. Fertilizer
16. Watering can

Task: Provide the environmental conditions that are essential for maintenance and growth of healthy potted plants.

Standard:

1. Light, water, humidity, temperature, cleanliness, feeding, and pot size and planting must meet requirements for each species.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Read pp. 266-279 Introductory Horticulture. Answer and discuss the questions at the end of the chapter.

2. Answer and discuss these questions:
    - a. Why is it necessary to fertilize potted plants?
    - b. Should the leaves of African violets be washed with soap and water?
    - c. Does it harm lily bulbs to cut the flowers from Easter lilies?
    - d. What causes parched leaves on potted plants?

3. Demonstrate to the class how to clean the leaves of an African violet.

4. Experiment: Place one (1) cup of water in a clean crockery pot for a week:
    - a. Allow the water to evaporate. Examine and describe salt or mineral residue. (Your instructor will describe the mineral contents of your local water supply.)
    - b. Discuss what these salts and minerals do to and/or for the plants.
        - (1) What minerals aid growth?
        - (2) What minerals retard growth?
        - (3) What minerals damage plants?

5. Read the label on a plant food container, provided by your instructor.
    - a. Make a chart of recommended feeding schedules for all the species of potted plants in your laboratory.
    - b. Practice mixing and applying the plant food. Your instructor will demonstrate the procedure and check your performance.

6. Review Information Sheet XI-B-1 ("Plant Ailment Chart"); study the section called "Damage":
    - a. Identify plants that have been "damaged."
    - b. Diagnose the cause of the damage.
    - c. Describe how you will care for the damaged plants.
    - d. Under the supervision of your instructor, provide the recommended treatment.

7. Select two (2) potted plants that appear to have poor drainage:
    - a. Demonstrate how to repot into a clay pot.
    - b. Demonstrate how to repot into a ceramic container.

8. Select a plant whose roots are congested:
    - a. Remove the plant from the pot:
        - (1) Examine the roots.
        - (2) Explain the damage or potential damage caused by congestion.
    - b. Select the correct type and size of pot for repotting.
    - c. Demonstrate how to repot the plant; arrange the roots for maximum growth and health of the plant.

9. Select 15 species of potted houseplants in the school greenhouse. These will be your "plant family":

   a. List each by its common name and botanical name.
   b. Group the plant list into separate lists according to the required:
      (1) Light
      (2) Temperature
      (3) Humidity
      (4) Watering
      (5) Fertilizer/food
   c. You will be responsible for the on-going care of these plants.
   d. Read Performance Check Sheet XI-B-2. Your instructor will rate your care of the plants; all items must be rated acceptable.

10. Role-play:

    Mr. and Mrs. Bunker and their two children have decided to "go green" in their home. They want plants for: (1) the kitchen, (2) the dining room, (3) the entry, (4) the living room, (5) the bathroom, (6) the family room, (7) the children's bedrooms (Lee Ann is 16 and Ned is 7). Mr. and Mrs. Bunker will draw a plan of their home, showing its orientation and shade; they will describe the color schemes, any special requirements, and other decorating information.

    a. Select two (2) to five (5) plants for each room.
    b. Demonstrate how to use these plants in their decor.
    c. Explain the best placement for each plant you have selected.
    d. The children are interested in caring for the plants in their bedrooms. Write out the directions for caring for their plants.
    e. Explain how to care for the plants in the rest of the house.
    f. Demonstrate any caring procedures that the Bunker's are unsure of.

PERFORMANCE CHECK SHEET:

ACTIVITY:	ACCEPTABLE	UNACCEPTABLE
LIGHT 1. Provided natural lighting wherever possible.		
2. Supplied fluorescent or incandescent lighting to achieve most natural light spectrum.		
3. Placed plants at sufficient distance from light source to avoid burning leaves.		
4. Turned plants daily to expose all sides to sun.		
WATER 1. Checked drainage system in pots; avoided water collection in pot base.		
2. Placed pebbles or crock over drainage hole in bottom of pot to improve drainage.		
3. Placed layer of potting soil and peat moss mixture to improve moisture retention in pot.		
4. Checked moisture level by sinking finger one (1) inch into topsoil. If moist, did not water.		
5. Watered plants with settled tepid water.		

PERFORMANCE CHECK SHEET (continued):

	ACCEPTABLE	UNACCEPTABLE
WATER (continued) 6. Checked natural habitat of each plant to determine humidity requirements: a. Tropical plants: (1) Used mist sprayer frequently or placed plants on tray of water filled with gravel.		
(2) Grouped plants closely so they could humidify each other.		
b. Desert plants: (1) Watered sparingly.		
(2) Did not mist.		
CLEANLINESS 1. Inspected plant leaves for dust and sticky dirt.		
2. Water-cleaned plants: a. Wiped hard-faced leaves with damp cloth once every two (2) weeks.		
b. Thoroughly doused moisture-loving plants with mist sprayer once every two (2) weeks to clean and humidify plant.		
3. Brushed hair-leaved plants lightly with soft brush to remove dust and dirt.		

PERFORMANCE CHECK SHEET (continued):

	ACCEPTABLE	UNACCEPTABLE
FOOD 1. Replenished soil's essential nutrients with fertilizer: a. At time intervals specified by plant food manufacturer.		
b. In amounts specified by plant food manufacturer.		
2. Allowed time for production of new roots on repotted plants before feeding.		

DUTY XII

DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Design vase arrangements
- Design body flowers and make bows
- Design hand arrangements
- Design baskets
- Design blankets and sprays
- Design wreaths and swags
- Decorate (dress) potted plants

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Student Competency Sheet

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Module A: Design Arrangements

Task 1: DESIGN VASE ARRANGEMENTS

Performance Checklist

1. Read customer order to determine size and type of arrangement.
2. Plan arrangement for color combination, relation to container, proportion, balance, distinction, originality, suitability, and condition of materials.
3. Draw a single line sketch of the arrangement.
4. Assemble tools and supplies at work area.
5. Inset oasis (optional): fill vase with room-temperature water.
6. Anchor oasis with floral tape.
7. Cut foliage stems in proportion to height of vase.
8. Insert foliage stems into vase.
9. Cut flower stems in proportion to height of vase.
10. Remove lower leaves (as required).
11. Wire stems (as required).
12. Insert flower stems in front of foliage, with tightest buds on upper flowers.
13. Tie bow and attach to wooden pick.
14. Insert bow and/or decoration.

Test

Items Needed:

1. Customer order
2. Vases, assorted
3. Cut flowers
4. Foliage
5. Dried flowers
6. Artificial flowers
7. Paper and pencil
8. Shredded styrofoam
9. Floral foam (oasis)
10. Floral tape
11. Floral knife and/or shears
12. Florist wire
13. Assorted sticks or support wires
14. Wooden picks
15. Ribbon and/or decoration
16. Wire service "arrangements of the month" brochures
17. Aquapics

Task: Design a vase of cut flowers and foliage which uses the principles of floral design.

Standard:

1. The finished vase arrangement must compare favorably with the instructor's model.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. In Volume I of Retail Flower Shop Salesperson and Floral Designer, read:

    a. Module FD-18 (Oval/Round Arrangement)
    b. Module FD-20 (Asymmetrical Triangle Arrangement)
    c. Module FD-22 (Vertical Arrangement)

2. Attend a lecture-discussion and demonstration on designing the basic floral shapes. Discuss:

    a. Appropriate uses of each shape of design.
    b. Appropriate plant materials.
    c. Appropriate containers.

3. Assemble, at your work space, one of each kind of vase in the shop:

    a. Explain:
        (1) What kind of arrangement you could make in each, considering shape of arrangement, color, design, intended use, and price of the arrangement.
        (2) How the height of the arrangement is related to the height of the container.
    b. Select three (3) of the containers (vases) and:
        (1) Plan three arrangements: an oval/round arrangement; an asymmetrical triangle arrangement; and a vertical arrangement.
        (2) Sketch your designs.
        (3) Assemble the tools and supplies.
        (4) Design the three arrangements.
        (5) Have three students and your instructor evaluate your work.
    c. Dust the unused containers (if necessary) and return them to storage, as directed by your instructor.

4. Attend a garden club flower show:

    a. Make sketches of the award-winning arrangements; indicate materials and colors used.
    b. Discuss the designs with your class.

5. Attend a lecture-demonstration on how to wire and tape cut flowers and foliage.

6. Visit a floral shop:

    a. Take notes of the flower arranging supplies in the shop.
    b. Make a list of supplies you would like to have in your own shop.
    c. Discuss your list with the class, in terms of quantities, utility of the items on your list, and costs.

7. Prepare the following arrangements:

   a. Vase arrangement for a hospital patient.
   b. Vase arrangement for a church wedding.
   c. Bud vase arrangement for a desk in a doctor's office.
   d. In a "customer's" own vase (from your home), design a dried floral arrangement to complement the vase.
   e. Vase arrangement, using artificial flowers (either those in the classroom or flowers you have made yourself).
   f. Vase arrangement for an "Early American" decor.
   g. Vase arrangement for a "Contemporary" decor.

8. Using a model provided by your instructor (or a picture model from a floral wire service), prepare a vase arrangement. Have your instructor check your work: all items on the Performance Checksheet must be rated acceptable.

9. Design an eggshell vase arrangement for a shut-in:

   a. Break an eggshell at the narrow end so that about two-thirds remains.
   b. Remove the inner contents of the shell; wash the shell.
   c. Paint the outside of the shell pale green or another pastel color.
   d. Glue a large white button to the base of the shell to serve as a stand.
   e. Fill the shell with good garden soil, plus a little charcoal.
   f. Arrange twigs of pussy willow and bits of interesting dried materials in the shell.
   g. At Eastertime, add a small bunny or chick decoration.
   h. Add one or two tiny growing plants.
   i. Sprinkle on fine grass seed.
   j. Water arrangement lightly with an eyedropper.
   k. Grass should sprout within a week to ten days.
   l. Trim grass with small manicure scissors.

PERFORMANCE CHECK SHEET:

ACTIVITY: Design Vase Arrangements	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Shape conforms to the ordered geometric pattern.		
2. Balance is observable (asymmetrical or symmetrical).		
3. All of the parts, including the container, flowers, and height and width of the arrangement, have size relationship (scale and proportion).		
4. Color, texture, and shapes of flowers and foliage blend together to create harmony.		
5. Arrangement has a focal area.		
6. Design reflects a feeling of motion toward the focal area (rhythm).		
7. Repetition is present in the elements of the arrangement.		
8. All of the parts blend together to appear as a single group of flowers (unity).		
9. Ribbon color and shape complement the arrangement.		

Student Competency Sheet

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Module A: Design Arrangements

Task 2: DESIGN BODY FLOWERS

Performance Checklist

1. Plan the corsage to incorporate the principles of floral design:
    - a. Shape
    - b. Scale and proportion
    - c. Harmony
    - d. Balance
    - e. Rhythm
    - f. Unity
    - g. Repetition
    - h. Focal point
2. Draw a single line sketch of the planned corsage, i.e.,
    - a. Crescent
    - b. Triangle
3. Assemble tools and supplies at work area.
4. Design the corsage.
    - a. Cut the stems from three or four flowers. Make the cut just below the calyx.
    - b. Wire each flower with either a chenille stem or 24-26 gauge floral wire. Tape each flower.
    - c. Cut tulle to form squares for tufts.
    - d. Wire the tulle to form the tufts. Tape the stem of each tuft.
    - e. Arrange flowers (and leaves) to form design.
    - f. Tape flowers together in desired shape.
    - g. Tie a corsage bow*, wire it, and attach it to the corsage.
    - h. Place wristband on corsage (triangle corsage).
    - i. Spray mist on the corsage.
    - j. Place corsage in corsage box.
    - k. Tag the corsage box for delivery or customer pick-up.
    - l. Place the corsage in cooler or delivery area.
    - * To tie a bow:
        1. Hang the ribbon over left thumb with long side in front. (Reverse this procedure if left-handed.)
        2. Take the long side of the ribbon with your right hand and loop it under and around the left thumb.
        3. Squeeze the ribbon between the left thumb and forefinger.
        4. Grasp the ribbon with the right hand about three inches from the crushed part and make a loop.
        5. Bring the ribbon to the spot between the left thumb and forefinger and crush it between the two.
        6. Go down the ribbon three (3) inches and loop it up under.
        7. Crush again between the left thumb and forefinger.
        8. Make three or four more loops twisting the ribbon in each direction until the bow reaches proper size.
        9. Make each set of loops slightly larger than the previous set.

10. Cut another piece of ribbon approximately eight inches long.
11. Insert this under the first small loop in place of your left thumb. Do this by pulling it down on both sides.
12. Tie it at the back.
13. Using the two ends of the short piece which you used to tie the bow together fasten the bow to the corsage snugly against the bottom flower and tie it securely with the short ribbon ends.
14. Trim off ribbon ends.

Test

Items Needed:

1. Leaves (fresh or artificial)
2. Flowers (roses, carnations)
3. Floral shears
4. Floral knife
5. Floral wire (24-26 gauge)
6. Chenille stems
7. Wire cutters
8. Tulle
9. Ribbon
10. Ribbon scissors
11. Hat pins
12. Bracelets

Task: Design body flowers (corsage).

Standard:

1. The finished corsage must compare with the instructor's model.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. In Volume I of *Retail Flower Shop Salesperson and Floral Designer*, read:
   a. Module FD-13 (Applying Spray Tints)
   b. Module FD-14 (Designing Boutonnieres)
   c. Module FD-15 (Designing Corsages)

2. Investigate (or attend a lecture-demonstration) and discuss:
   a. Kinds of flowers suitable for body flower arrangements.
   b. Kinds of flowers *not* suitable for body flower arrangements.
   c. Kinds of flowers used for hair decoration.
   d. Special precautions and procedures to be observed when using exotic flowers (such as orchids).

3. Watch a demonstration on constructing a corsage and other body flowers.

4. Practice constructing a corsage. Use natural-colored flowers.

5. Watch a demonstration on how to tie a bow.

6. Practice tying bows.

7. Teach another student how to tie a corsage bow.

8. Watch a demonstration on how to spray-tint a carnation. Observe safety precautions.

9. Spray-tint a carnation pale yellow for a boutonnier.

10. Assemble a boutonniere for a formal wedding.

11. Design and construct a wrist corsage for the Homecoming Dance. (The gown is rust color.)

12. Design a corsage for a Mother's Day order:

    a. Select the flowers, ribbon, and tools.
    b. Prepare the corsage.
    c. Have your instructor evaluate your work. All items on the Performance Check Sheet must be rated acceptable.

PERFORMANCE CHECK SHEET:

ACTIVITY: Design Corsages	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Shape conforms to the ordered geometric pattern.		
2. Balance is observable (asymmetrical or symmetrical).		
3. All of the parts including flowers, and height and width of the arrangement have size relationship (scale and proportion).		
4. Color, texture, and shapes of flowers and foliage blend together to create harmony.		
5. Design reflects a feeling of motion.		
6. All of the parts blend together to appear as a single group of flowers (unity).		
7. Bow color, shape and appearance complement the flowers.		

Student Competency Sheet

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Module A: Design Arrangements

Task 3: DESIGN HAND ARRANGEMENTS

Performance Checklist

1. Plan the hand arrangement to incorporate the principles of floral design.
2. Draw a single line sketch of the planned hand arrangement:
   a. Colonial
   b. Crescent
   c. Cascade
3. Assemble tools and supplies at work area.
4. Design the hand arrangement.
   a. Cut each flower stem approximately 1/4" long.
   b. Wire and tape each flower.
   c. Arrange outline flowers and tape together.
   d. Add filler flowers to arrangement, after wiring and taping each one.
   e. Wire and tape the foliage and add it to bouquet.
   f. Cut netting to form squares for tufts.
   g. Wire netting to form tufts. Tape the stem of each tuft.
   h. Add tufts to hand arrangement.
   i. Wrap bouquet handle with two layers of ribbon.
   j. Tie a bow with streamers and place in arrangement. (optional)
   k. Package the arrangement for storage.

Test

Items Needed:
1. Floral shears or knife
2. Scissors
3. Ribbon
4. Netting
5. Floral tape
6. Floral wire (20 and 24 gauge)
7. Foliage
8. Bouquet handle
9. Box or plastic container

Task: Design a hand arrangement.

Standard:
1. The finished hand arrangement must compare with the instructor's model.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Read Module FD-65, Retail Flower Shop Salesperson and Floral Designer.

2. Attend a lecture-discussion on designing hand arrangements. Discuss:
   a. Kinds of hand arrangements.
   b. Kinds of flowers suitable for hand arrangements.
   c. Kinds of flowers not suitable for hand arrangements.
3. Watch a demonstration on how to construct a hand arrangement.
4. Design and construct a small bouquet or nosegay for a bridesmaid in a summer wedding. The gown color is peach.
5. Design a nosegay for a Junior-Senior Prom. The theme of the dance is the school's 50th anniversary. The girl will be wearing a gold gown.
6. Sketch a design for an arrangement which will cover a prayerbook to be carried by a tall, slender spring bride.
7. Design and construct a round, colonial bridal bouquet for a fall wedding.
8. Design and construct hand arrangements for the bridal party of the bride in Learning Activity 7. The maid of honor will wear deep royal blue velvet; the bridesmaids will wear rich purple velvet. Have your instructor evaluate your performance; all items on the Performance Check Sheet must be rated acceptable.
9. Design and construct a bridal cascade for a June wedding. Have your instructor check your performance. All items on the Performance Check Sheet must be rated acceptable.
10. Design and construct hand arrangements for the bridal party of the bride in Learning Activity 8. This will be a very formal wedding. The maid of honor will wear pale pink with moss green trim; the bridesmaids will wear a soft, medium shade of pink with moss green trim. Your instructor will check your performance; all items on the Performance Check Sheet must be rated acceptable.

PERFORMANCE CHECK SHEET:

ACTIVITY: Design Arrangements	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Shape conforms to the ordered geometric pattern.		
2. Selected appropriate flowers, foliage, ribbon.		
3. Wired flowers according to appropriate method for each kind of flower.		
4. Taped flower stems and foliage smoothly and tightly.		
5. Wrapped handle in two layers of ribbon.		
6. Completed arrangement incorporates the principles of floral design: a. Shape b. Scale and proportion c. Balance d. Harmony e. Repetition f. Unity g. Focal area		

PERFORMANCE CHECK SHEET:

ACTIVITY: Design Baskets	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Shape conforms to the ordered geometric pattern.		
2. Balance is observable (asymmetrical or symmetrical).		
3. All of the parts, including the basket, flowers, and height and width of the arrangement, have size relationship (scale and proportion).		
4. Color, texture, and shapes of flowers and foliage blend together to create harmony.		
5. Arrangement has a focal area.		
6. Repetition is present in the elements of the arrangement.		
7. All of the parts blend together to appear as a single group of flowers (unity).		
8. Ribbon color and shape complement the arrangement.		
9. Enclosure card is attached.		

Student Competency Sheet

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Module A: Design Arrangements

Task 4: DESIGN BASKETS

Performance Checklist

1. Plan the basket to incorporate the principles of floral design:
   - a. Shape
   - b. Scale and proportion
   - c. Harmony
   - d. Balance
   - e. Rhythm
   - f. Unity
   - g. Repetition
   - h. Focal point
2. Draw a single line sketch of basket.
3. Assemble tools and materials at work area.
4. Prepare basket to receive flowers:
   - a. Cut a piece of absorbent foam to fit container.
   - b. Soak foam in water.
   - c. Place foam into basket over a bed of shredded foam.
   - d. Anchor foam with floral tape.
5. Construct basket arrangement, using the single line sketch as a guide. Baskets can be either symmetrical or asymmetrical triangles. The following is a guide for the symmetrical triangle arrangement:
   - a. Cut the length of the first flower approximately two-and-one-half (2 1/2) times the height of the basket.
   - b. Wire the cut flowers. (optional)
   - c. Insert first flower in foam (vertically, at the center back of the basket).
   - d. Insert the second and third flowers at each end of the foam (forming right angles to the first vertical flower).
   - e. Insert a large flower in the foam at the front of the basket (to provide a focal area).
   - f. Fill in open spaces in basket with additional flowers (without overcrowding or breaking the line of the triangular arrangement).
   - g. Fill in the arrangement with foliage (covering the rim, the back, and the "mechanics" of the arrangement).
   - h. Tie a bow; insert bow into front of basket.
   - i. Write and attach enclosure card.

Test

Items Needed:
1. Cut flowers
2. Foliage
3. Basket
4. Floral tape
5. Floral knife and/or shears
6. Floral foam
7. Floral wire (optional)
8. Ribbon (for bows)
9. Ribbon (for display)
10. Metallic paper letters and words
11. Enclosure card
12. Assorted fruits, nuts, candies

Task: Design a basket arrangement.

Standard:
1. The finished basket must compare with the instructor's model.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Read Module FD-60, Retail Flower Shop Salesperson and Floral Designer.

2. Watch a demonstration on basket design.

3. Sketch two designs for a funeral basket, one using floral foam and one using no floral foam:

   a. Show where each flower will be inserted into floral foam in Basket #1.
   b. Show where each flower will be positioned in Basket #2 (which does not have floral foam).

4. Visit a local florist. Observe:

   a. How orders are processed.
   b. How basket arrangements are prepared.

5. Attend a lecture-discussion on the selection and use of materials for basket arrangements. Discuss:

   a. Should sharply contrasting colors be used in a funeral basket?
   b. What types of flowers are most often used in funeral baskets?
   c. What is a filler flower used for in designing baskets?
   d. What kinds of greens/foliage are most often used in funeral baskets?
   e. What kinds of greens/foliage are most economical to use in funeral baskets?
   f. Can fresh flowers be used in a straw basket arrangement?
   g. Would a basket arrangement be appropriate to congratulate a new mother in the hospital? Or to wish a new business good luck?

6. Prepare a funeral basket ordered for a deceased grandfather by his grandchildren. Your instructor will check your work. All items on the Performance Check Sheet must be rated acceptable.

7. Mr. and Mrs. Alias Smith-Jones, interior decorators, want an assortment of basket arrangements to be sent to some of their customers. Prepare the arrangements to fill the following orders:

   a. To Mrs. Fawcett Farah - Straw basket to be used as a Thanksgiving table centerpiece.
   b. To Ajax Pizza - Basket arrangement, as "good luck" wish for new shop.

c. To Mr. Harry Winkler - Fruit basket arrangement, as Christmas gift.
d. To Ms. Alexis Karas - Basket arrangement, as "good luck" wish for new shop which sells western tack and clothing.
e. To Mr. John Kemp - "Good luck" arrangement for the opening night of a new show in his remodeled red-barn theater.
f. To Dr. Mattie Rugg - "Best wishes" arrangement on the opening of her new dental offices.
g. Each arrangement will be evaluated by your instructor. All items on the Performance Check Sheet must be rated acceptable.

Student Competency Sheet

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Module A: Design Arrangements

Task 5: DESIGN BLANKETS AND SPRAYS

Performance Checklist

1. Plan the blanket to incorporate the principles of floral design.
   a. Shape
   b. Scale and proportion
   c. Harmony
   d. Balance
   e. Rhythm
   f. Unity
   g. Repetition
   h. Focal area
2. Assemble tools and supplies at the work area.
3. Prepare a blanket:
   a. Cover burlap with green waxed paper (overlap the sheets well).
   b. Place generous layer of flat garland greens on top of waxed paper.
   c. Head the greens to the edge all the way around the blanket (with the butt ends pointing toward the center).
   d. Cut off coarse stems to maintain blanket flexibility.
   e. Fasten greens to blanket (by pushing a five (5) inch piece of 24 or 26 gauge wire through the base and back up over the stems of the calyx).
   f. Wire flowers to blanket. (Breaking flower head from the stem and insert a hairpin-shaped wire through the calyx.)
   g. Push the wire through the cloth, twist it, and bring it up through the cloth again.
   h. Wire each flower to the blanket.
4. After all flowers have been wired to the blanket, cover the back with a piece of satin, sateen, or another piece of burlap (to prevent wires from scratching the surface the blanket will cover). Sew the backing to the front piece.
5. Tie bows and streamers if desired and place in focal areas of the blanket.
6. Spray-mist blanket evenly.
7. Prepare a spray:
   a. Select a holding device for flowers, such as styrofoam.
   b. Form the background (use short branches of foliage to produce a shield-shaped background).
   c. Cut each flower slightly longer than the background.
   d. Wire flowers, if necessary.
   e. Place each flower item in a waterpick.
   f. Insert each flower into the styrofoam (so that it faces upward and outward).
   g. Attach the holding device to the easel.
   h. Write and attach enclosure card.

Test

Items Needed:
1. Cut flowers (chrysanthemums, carnations, gladioli)
2. Foliage (plumosa, similax, pine, leather leaf, salal)
3. Floral knife or shears
4. Wire cutters
5. Burlap for blanket and backing (4-1/2' x 7', 3' x 5', or 5' x 9')
6. Green waxed paper
7. Greening pins
8. Florist twine
9. Ribbon scissors
10. Floral foam
11. Foil
12. Wooden picks
13. Chenille stems
14. Ribbon
15. Holding device for spray
16. Easel
17. Water sprayer
18. Aquapics
19. Floral wire (24-26 gauge)

Task: Design a floral blanket and standing spray.

Standard:
1. The finished basket or spray must compare with the instructor's model.
2. All items on the Performance Check Sheet for blankets or sprays must be rated acceptable.

Learning Activities

1. Read pp. 96-97, Retail Flower Shop Operation and Management.

2. Attend a lecture-demonstration on how to prepare blankets and sprays. Discuss:

   a. Why are flowers inserted in aquapics before being used in a spray?
   b. Why is burlap used in a blanket design?
   c. What flowers would be appropriate to use in a casket blanket?
   d. What flowers would not be appropriate to use in a casket blanket?

3. Watch your instructor demonstrate how to wire flowers to a burlap backing; watch your instructor demonstrate how to cover backing with finishing cover and sew cover to front piece.

4. Practice wiring flowers to burlap backing for a casket blanket.

5. Design and prepare a casket blanket. Your instructor will provide a model. Have the instructor check your work. All items on the Performance Check Sheet must be rated acceptable.

6. Design a blanket arrangement to be draped on the winning horse at the racetrack.

7. Design and prepare a funeral spray arrangement. Use salal and gladioli, with white poms as filler flowers. Have your instructor evaluate your work. All items on the Performance Check Sheet must be rated acceptable.

PERFORMANCE CHECK SHEET:

ACTIVITY: Design Blankets and Sprays	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Symmetrical balance is observable in the blanket or spray.		
2. Color, texture, and shapes of flowers blend together to create harmony.		
3. Repetition is present in the elements of the blanket or spray.		
4. All of the parts blend together to create unity.		
5. All flowers are firmly attached to the backing in a blanket design.		
6. The completed spray is firmly attached to its stand.		

Student Competency Sheet

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Module A: Design Arrangements

Task 6: DESIGN WREATHS AND SWAGS

Performance Checklist

1. Plan the wreath or swag to incorporate the principles of design:
    - a. Shape
    - b. Scale and proportion
    - c. Harmony
    - d. Balance
    - e. Rhythm
    - f. Unity
    - g. Repetition
    - h. Focal area
2. Assemble tools and supplies at work area.
3. For evergreen wreath:
    - a. Insert filler into frame; dampen filler.
    - b. Wrap frame.
    - c. Punch three (3) to four (4) inch lengths of greenery into frame.
4. For door swags:
    - a. Group 24"-36" evergreen branches.
    - b. Wire branches together at top. Leave small loop (for hanger).
    - c. Wire on accent decorations.
    - d. Tie on bow.
5. For delarobia wreath:
    - a. Insert foundation cones (inner and outer frame rows).
    - b. Attach wire to cone and weave wire through frame.
    - c. Secure wire.
    - d. Wire on center cones.
    - e. Wire on accent pieces. (If seed pods or nuts are used, they must be drilled before wiring.)
    - f. Spray with lacquer, if desired.

Test

Items Needed:

1. Evergreens, boxwood
2. Seed pods, nut pods, cones
3. Box wreath wire frame
4. Styrofoam ring
5. Spagnum moss or straw
6. Plastic wreath wrap
7. Drill and bit
8. Wire cutters
9. Scissors
10. Floral wire (16 and 22 gauge)
11. Streamer ribbon
12. Floral knife or shears
13. Clear lacquer
14. Spray gun
15. Water

Task: Design an evergreen wreath, a delarobia wreath and a swag.

Standard:

1. The material on the evergreen wreath must flow smoothly and evenly in one direction.
2. Foundation cones on the delarobia wreath must be of equal size and securely attached.
3. Accent cones in the center row of the delarobia wreath must provide contrast to the inner and outer rows and must be securely attached.
4. On wreaths, there must be no open spaces (foundation materials must not show).
5. Swags must be securely fastened together and must be grouped to provide rhythm, harmony, and balance.

Learning Activities

1. Read pp. 57-63, Introductory Horticulture.

2. Watch a lecture-demonstration on choosing materials and constructing an evergreen wreath.

3. Design and construct an evergreen wreath. Have your instructor check your work.

4. Watch a lecture-demonstration on choosing materials and constructing a door swag.

5. Design and construct a pine bough spray, or swag, to be used as a Christmas door decoration. Have your instructor check your work.

6. Watch a demonstration on how to drill nuts and other materials. Take notes of safety precautions.

7. Under the supervision of your instructor, drill holes in seed pods and nuts.

8. Watch a demonstration on choosing materials and constructing a delarobia wreath.

9. Design and construct a delarobia wreath. Have your instructor check your work.

Student Competency Sheet

Duty XII: DESIGNING WITH FLOWERS AND DECORATIVE MATERIALS

Module A: Design Arrangements

Task 7: DECORATE (DRESS) POTTED PLANTS

Performance Checklist

1. Assemble tools and materials at work area.
2. Cut covering material for the pot.
3. Enclose base of potted plant in covering.
4. Tie a piece of ribbon around the pot and its cover.
5. Tie a bow. (Use a ribbon color that will complement the color of the plant and the covering material.)
6. Tie a bow; attach bow to ribbon with wire.
7. Twist wire to secure bow.

Test

Items Needed:
1. Potted plant
2. Floral foil
3. Ribbon
4. Designer's tools
5. 26-gauge floral wire

Task: Decorate (dress) the potted plant.

Standard:
1. The finished dressing should extend at least two (2) inches above the rim of the pot and be cupped under the lower growth of foliage.
2. The bow must be symmetrical and securely attached to the pot.

Learning Activities

1. Read p. 103, Retail Flower Shop Operation and Management, and/or read Module FD-35, Retail Floral Shop Salesperson and Floral Designer.

2. Watch a demonstration on how to cut and wrap floral foil to dress a potted plant.

3. Discuss:

   a. Reasons, other than decoration, for wrapping the pot in foil.
   b. Whether it is necessary to dress a potted plant which is already in a decorative ceramic pot.
   c. How to decorate a terrarium.

   d. Materials and objects other than foil and ribbon that can be used to decorate potted plants.
   e. Decorative materials and colors that make the flower or plant appear to be suited for a particular season or purpose.
   f. How "packaging" increases the salability of a plant.

4. Visit a floral shop, read home-decorating magazines, and look up the prices of pot decorations and decorative containers:

   a. Discuss ideas you liked (which decorative items you felt enhanced the plant and its salability).
   b. Look up the prices of the items you liked. Record them.
   c. Determine the quantities of each that you would keep in stock in your shop.

5. Examine decorative pots and other kinds of containers in your school laboratory, in your home, in stores and shops. Discuss:

   a. The variety of containers you found that would be suitable for retail sales of potted plants, dish gardens, and terrariums.
   b. What kinds of dressing you would add to increase salability?

6. Select three (3) unusual containers that you feel have decorative value:

   a. Describe to your instructor the kinds of plants you feel would be suited for these containers.
   b. Select a plant or several plants for each of the three containers.
   c. Prepare the containers, and plant the plants.
   d. Decorate the containers, if necessary.
   e. Have the class discuss your choices, or
   f. Have a mini plant show: work in teams to judge the selections, artistry, and workmanship.

7. Practice measuring and cutting a square piece of foil to cover a potted plant.

   a. Cover the plant; add the ribbon and bow.
   b. Ask a classmate to evaluate your choice of colors and your work.

8. Select three (3) different kinds of potted plants. Dress each plant. Have your instructor evaluate your work.

DUTY XIII

MERCHANDISING

Terminal Objectives

Upon completion of the modules in this unit, you will:

- Order supplies for retailing
- Establish prices for retail items
- Select advertising media
- Prepare advertising copy and layout
- Arrange showroom displays
- Design and locate special indoor displays
- Design and locate outdoor displays
- Provide helpful information to customer or recipient
- Register a sale of merchandise
- Place or receive orders through wire services
- Deliver merchandise

Student Competency Sheet

Duty XIII: MERCHANDISING

Module A: Establish Prices

Task 1: ORDER SUPPLIES

Performance Checklist

1. Read order to determine that all merchandise is clearly listed.
2. Telephone the wholesaler.
3. Identify self and name of florist to order clerk.
4. Place the order by giving the order clerk:
   a. Name or description of each item.
   b. Size of each item (if applicable).
   c. Quantity wanted.
5. Ask order clerk to verify the complete order by reading it back.
6. Note any item that wholesaler cannot supply.
7. Be prepared to make second choices.
8. Specify pick-up or delivery.
9. Write on order form the date and time order was placed, the name of the wholesaler, and the name of the person who took your order.

Test

Items Needed:
1. Shop order (list of merchandise to be ordered)
2. Telephone
3. Tape recorder

Task: Telephone a shop order to a wholesale florist.

Standard: Type, quantity, and size of supplies ordered must meet shop's needs for quality, price, and date of delivery.

Learning Activities

1. Read pp. 112-113, Retail Flower Shop Operation and Management.

2. Attend a lecture-demonstration on how to place an order to a wholesale supplier over the telephone. Discuss:

   a. The information you need to have to place the order. Discuss such items as:
      (1) Who determines what shall be ordered.
      (2) How often orders are placed.
      (3) Orderly management of telephone numbers that are used frequently.

    (4) How many suppliers you will probably deal with: for flowers; for fruits; for consumable supplies such as wire, foil, soil, containers, etc.; facilities maintenance.
  b. Terminology to use in placing orders.
  c. Telephone costs.
  d. Telephone procedures and manners. How do they affect the relationship with the wholesaler? How do they affect the probability of getting what you ordered?

3. Select a 300-word paragraph, a script, or other written message:

    a. Read and tape-record the story or message.
    b. Play back the recording. Ask yourself these questions:
        (1) Did I speak clearly?
        (2) Did I use emphasis in my talk, or was it monotonous?
        (3) Did I sound professional?
    c. Re-record the same story or message.
        (1) Play it back for a classmate.
        (2) Have your partner answer the same questions about your delivery patterns.

4. Practice using a telephone and record your conversation. Discuss:

    a. Whether you greeted the person you called in a friendly, professional manner.
    b. Whether you gave your order completely, in an orderly manner.
    c. Whether you and the person you called exchanged all the necessary information.
    d. Whether you finished the conversation in a friendly, professional manner.

5. With a partner, prepare a list of ten (10) species of flowers, five (5) species of potted plants, and other supplies to be ordered from a local wholesaler for Thanksgiving sales. Include vases, floral foam, and other materials you will need to market the flowers and plants. (If the wholesaler does not carry these items, mark your list to indicate where and how they are ordered.)

6. Role-play a telephone order to a wholesaler to obtain the items you listed in Learning Activity 5:

    a. Tape-record the conversation.
    b. You play the role of the florist.
    c. Ask your partner to play the role of the wholesale order clerk.
    d. Play back the recording and discuss how well you and the "wholesale order clerk" communicated.

7. Play back your recorded telephone order to the class:

    a. Ask for comments to improve the ordering process and your telephone technique.
    b. Record the order again. Use improved methods suggested by the class.
    c. Have your instructor evaluate your performance.

8. Prepare a written order and the envelope. Have your instructor check your work.

9. Attend a lecture-discussion on how to follow-up on orders. Discuss:

   a. How and where orders are filed until the order is delivered.
   b. How to check a delivery to be sure all items were delivered.
   c. How to process the order form so that billing can be verified.
   d. How to follow-up an incomplete order.
   e. How to make substitutions for an incomplete order.

10. "Telephone" a partner who is the "wholesale order clerk" at the establishment that didn't send you a complete order. Discuss:

    a. How effectively you communicated (completeness of statements, manner, etc.).
    b. Whether you reached a satisfactory agreement about substitutions, billing, etc.

Student Competency Test

Duty XIII: MERCHANDISING

Module A: Establish Prices

Task 2: ESTABLISH PRICES FOR RETAIL ITEMS

Performance Checklist

1. Determine total cost of the floral product sold and services performed including:
    a. Wholesale cost of materials.
    b. Overhead costs such as rent, interest on investment, insurance and bad debts.
    c. Labor cost in designing, packaging or selling of item.
    d. Advertising and sales promotion costs.
    e. Delivery cost.
    f. Management cost.
2. Adjust pricing to remain competitive with other florists, unless product or service offered is of superior quality.
3. Set final selling price based on volume and competition.

Test

Items Needed:
1. Financial records
2. Pencil
3. Paper
4. Calculator

Task: Establish prices for retail items.

Standard: Final selling price should reflect all costs for labor, materials and overhead plus a reasonable profit based on industry standards.

Learning Activities

1. Read pp. 318-323, Retail Merchandising and read pp. 113-114, Retail Flower Shop Operation and Management.

2. Attend a lecture-discussion on the American free enterprise system. Discuss:

    a. The role of the florist in the free enterprise system.
    b. Economic and social conditions that affect market prices.
    c. What happens to a market when there is no competition.
    d. What happens to prices when the source of supply is far away.
    e. How the florist's prices are affected when there are two or more florists in the same locale.

3. Answer and discuss these questions:

   a. What is the most important factor in establishing a retail price?
   b. What other factors must be considered before setting a selling price?
   c. Why is it a good idea to buy items in several different price ranges?
   d. Why does a retailer mark down merchandise?
   e. What is "mark-up?" How is it calculated?
   f. What is the advantage of offering daffodils, for example, at a price that is lower than the average mark-up?
   g. What is a reasonable average mark-up for a floral shop in your locale?

4. You work in a small, local floral shop. The owner of the shop feels that a new line of merchandise (such as dish gardens and terrariums) should be added. The owner assigns you the job of checking out competitors to find out what they are offering in terms of: types of terrariums, sizes, styles, and prices.

   a. Choose two competitors that sell (dish gardens and terrariums).
   b. Design a comparison shopping form to use when you visit the two competitors. Include the following:
      (1) Name of store visited
      (2) Address of store visited
      (3) Name of item observed
      (4) Quantity of item offered
      (5) Styles offered
      (6) Prices
      (7) Additional comments
   c. Present your findings to the "owner" (a classmate). Discuss whether you should add the new items. If so, how many, what kind, and at what prices? Have your instructor evaluate your decision.

5. Calculate prices for the following items in your shop which are to be marked down to make room for Christmas merchandise:

   a. Take 1/3 off all foliage plants now selling at $5.99 each. Record the sale price.
   b. Take 20% off all flowering plants now selling at $7.98 each. Record the sale price.
   c. Reduce all dried floral arrangements by 10% for a special Thanksgiving centerpiece sale. Compute the reduced prices for three (3) sizes of dried arrangements now selling for $7.50, $10.50, and $16.50.
   d. All hanging baskets are to be sold at a 1¢ sale. If the customer selects two baskets which normally sell for $6.99 each, what is the total price the customer will pay for both baskets during the 1¢ sale?

6. Your instructor will provide examples of a floral shop's financial record. The instructor will explain the items on the record and how they were calculated. Examine the examples; then discuss, in terms of your locale:

    a. Wholesale costs
    b. Overhead costs
    c. Labor costs
    d. Advertising costs
    e. Delivery costs
    f. Management costs

7. You are the co-owner of a floral shop, "The Giant Green Thumb." Work with your partner; use the example(s) provided in Learning Activity 6:

    a. Adjust these items to prepare a yearly budget for your shop.
    b. You and your partner must agree on each budgeted item.
    c. Review the proposed budget with your instructor.

8. Your instructor will assign an item for you to price for retail sale.

    a. Calculate the cost of producing/preparing 25 units of the item.
    b. Calculate the cost of producing/preparing ten (10) units of the item.
    c. Calculate the cost of producing/preparing 100 units of the item.
    d. Discuss whether it is cheaper to produce/prepare large quantities or small quantities. (Consider quantity buying, sales potential, what happens to unit cost if the item does not sell, etc.)
    e. Set a selling price for the item.
    f. Have your instructor check your calculations. Discuss whether you considered all important factors in establishing the item price.

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Student Competency Sheet

Duty XIII: MERCHANDISING

Module B: Advertising

Task 1: SELECT ADVERTISING MEDIA

Performance Checklist

1. Determine what type of buyer spends the most money on flowers.
2. Write down the most important selling point for your flowers and services.
3. Ask local newspaper, radio, and outdoor billboard sales representatives for their advertising rates.
4. Decide which advertising medium best meets your budget.

Test

Items Needed:
1. Advertising media cost sheets
2. Direct mail samples, such as calendars, leaflets, etc.
3. Samples of printed ads

Task: Select advertising media.

Standard: Advertising medium selected should reach the greatest number of potential customers at the lowest cost per thousand people reached by the ad.

Learning Activities

1. Read pp. 410-418, Retail Merchandising and read pp. 114-116, Retail Flower Shop Operation and Management.

2. Attend a lecture-discussion on how to select advertising media. Answer these questions and discuss:

   a. What is word-of-mouth publicity?
   b. How do you decide which is the best newspaper to advertise in?
   c. What is direct mail advertising?
   d. What is "good will" advertising? What publications in your locale fall into this category?
   e. Is radio a good advertising medium for florists?
   f. Why would a florist use outdoor advertising?
   g. What is the purpose of handbill advertising? How would you distribute handbills in your locale? Where?
   h. How does a florist decide how much money will be spent on advertising?

3. Compare costs of advertising in your locale. Include:

    a. Newspaper advertising:
        (1) Make a chart with three columns headed: Size of Ad; Number of Days; Cost.
        (2) Call the advertising department of your local newspaper.
        (3) First, ask for their circulation total (so you can estimate how many readers will see your ad).
        (4) Find out the advertising rates for a full-page ad, a half-page ad, and a quarter-page ad.
        (5) Get the cost of these ads for three (3) days and for a full week. Record these prices on your chart. Discuss which is most economical.
    b. Radio advertising:
        (1) Call the sales representative at the local radio station.
        (2) Ask for rates for a 30-second commercial and for a 60-second commercial to run for one week before a holiday.
    c. If you live in an area which has a local firm that sells outdoor advertising, find out the costs.
    d. Compare all these costs (newspaper, radio, outdoor advertising). Do you feel the anticipated sales justify the costs? Why? Explain your analysis to a partner or to your instructor.

4. You and your partner own the Giant Green Thumb, a floral shop. You need to make an advertising plan and an advertising budget for the coming fiscal year.

    a. Decide how much you will spend in advertising over the year.
    b. Determine which medium (media) will give you the most effective coverage. (Consider number of people reached, types of people reached, etc.)
    c. Allot (in dollars per month) how much you will spend through each of the media you have selected. (Keep good will advertising in mind: yearbooks, booster's club, etc.)
    d. Your instructor will evaluate your work. Discuss the evaluation.

5. Discuss how much advertising a greenhouse owner/manager must do versus how much is necessary for a floral shop.

Student Competency Sheet

Duty XIII: MERCHANDISING

Module B: Advertising

Task 2: PREPARE ADVERTISING COPY AND LAYOUT

Performance Checklist

1. Write copy outline based on the most important selling point or points your floral shop has to offer.
2. Draw a thumbnail sketch of the layout of the ad which includes the following elements:
    a. A headline that attracts attention and has audience appeal.
    b. Body copy which is true, clear, informative, and persuasive.
    c. Layout which is uncluttered, with sufficient white space for easy reading.
    d. A closing statement or clincher.
    e. An eye-appealing photograph or drawing or border.

Test

Items Needed:
1. Sample print ads or radio tapes or TV scripts
2. Ruler
3. Pencil
4. Paper

Task: Prepare advertising copy and layout.

Standard:
1. Advertisement must present the florist's message clearly and attractively to produce the most sales for dollars spent.
2. Copy must be clear, concise, and appealing, and must include all relevant information about the merchandise or service offered.
3. Headline must be brief, must attract attention, and inspire the reader to read further.
4. Layout must include headline, lines indicating space for body copy, illustration, white space for emphasis to design, store logo, location and telephone number of store. It may include a border for emphasis.
5. Layout design should "flow" so that reader's eye is carried naturally from one element of the ad to the next.
6. Grammar, spelling, and punctuation must be correct.

Learning Activities

1. Read pp. 424-437, Retail Merchandising.

2. Write a letter to: American Association of Advertising Agencies, 420 Lexington Avenue, New York, New York 10017. Request some basic literature on how to prepare advertising copy and layout.

3. Discuss the following statements with a small group:

   a. Advertising copy must be truthful.
   b. Easy reading is more important in an advertisement than in a news article.
   c. Advertising copy should contain no words that stop the reader's flow of thought.
   d. An ad with a very "busy" layout discourages the potential customer from reading your ad.

4. Attend a class discussion on the following elements of an ad layout provided by the instructor:

   a. General layout: does it give a feeling of motion, flowing from the headline down to the final lines? Does it reflect the feeling you want to convey about your shop?
   b. Headline: does it attract attention? Does it make the reader want to read further?
   c. Copy: is it concise? factual? complete? interesting without being silly or wordy?
   d. Illustration: does it show exactly what you are offering for sale? is it interesting?
   e. White space: is it used effectively (emphasize the copy but not waste unnecessary space)?
   f. Border: what other kinds of borders would be appropriate? how large? what does the border do for the ad?
   g. Logo, or signature, of the shop: is the logo design appropriate for the store? is it too large or too small? is it well-placed in the ad? are the shop's address and phone number clearly visible?

5. Attend a class discussion on what makes good "copy." Discuss:

   a. What information must be given about the product; how it should be written.
   b. What is a "clincher?"
   c. How important is grammar and punctuation in writing copy? Can you expect the newspaper staff to make corrections?

6. Make a classroom scrapbook of newspaper and magazine ads used by florists, nurseries, and greenhouses:

   a. Analyze the ads in the scrapbook to see if they contain all of the elements in the Performance Checklist.
   b. Decide which element is used most effectively in each ad.
   c. Rewrite an ad in the scrapbook that you feel you can improve.

7. Write the headline and copy for an advertisement for your local newspaper. ~~The~~ Giant Green Thumb is featuring sweetheart roses for Valentine's Day. Before you write, think about the best way to appeal to a customer:

   a. Will my product make the purchaser feel more important?
   b. Will my product make the purchaser happier?
   c. Will my product appeal to the buyer as a bargain?
   d. Will my product or service save the buyer time and effort?

8. Prepare a thumbnail sketch of the ad layout for sweetheart roses.

   a. Include in your design:
      (1) The headline
      (2) Space for the copy
      (3) Illustration
      (4) White space
      (5) Border
      (6) Logo of store (plus address and telephone number)
      (7) Reference to wire service(s) your store subscribes to.
   b. Attach your thumbnail sketch to the copy you wrote in Learning Activity 7.
   c. Have your class react to your ad.
   d. Your instructor will evaluate your work.

Student Competency Sheet

Duty XIII: MERCHANDISING

Module C: Displaying Merchandise

Task 1: ARRANGE SHOWROOM DISPLAYS

Performance Checklist

1. Make a sketch of the best traffic pattern and layout of tables to display your merchandise.
2. List the furniture, props, lighting fixtures, merchandise, and accessories needed for the display.
3. Clean and repair showroom display furniture, props, table covers, and decorations.
4. Set up the display, arranging merchandise for maximum eye-appeal.
5. Hand letter show/price cards and add them to display.

Test

Items Needed:

1. Display props
2. Cut flowers
3. Foliage
4. Bud vases
5. Centerpieces
6. Table arrangements
7. Novelty arrangements
8. Show/price cards
9. Lettering pen

Task: Arrange showroom displays.

Standard:

1. The showroom display will be attractive and incorporate the principles of floral design.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Read pp. 322-326, Retailing Principles and Practices and read the following pages in Retail Merchandising:
    - pp. 439-442 - "Psychology of Display"
    - pp. 443-449 - "Window Displays"
    - pp. 449-454 - "Interior Displays"
    - pp. 455-461 - "Color and Design"
    - pp. 462-470 - "Creating Effective Displays

    Answer the questions at the end of the sections. Discuss them with the class.

2. Experiment with several heights of props on one table to accommodate a display of house plants.

3. Select a table for a showroom display of flowering plants. Cover the table with a clean cloth (color should reflect a mood or decor). Arrange several plants on the table in a seasonal display.

4. Visit a local florist to rate the showroom displays. Familiarize yourself with the items on Performance Check Sheet XIII-C-1; rate the display; complete the Check Sheet after you leave the shop.

5. Make a list of props available in your shop. Think about how you would use each to display merchandise. Experiment with arrangements.

6. Your instructor will assign a table or an area:

   a. Select a theme.
   b. Draw a sketch of a display for that area.
   c. Select the merchandise and the props.
   d. Build the display.
   e. Have a partner evaluate your display. Then, discuss improvements.
   f. Have your instructor evaluate your display, according to the Performance Checklist. All items must be rated acceptable.

7. With a partner, evaluate the displays of other class members.

PERFORMANCE CHECK SHEET:

THE SHOWROOM DISPLAY:	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Attracts the attention of customers.		
2. Provides enough aisle space to allow customer to move about easily.		
3. Props are structurally designed to safely support displayed merchandise.		
4. Lighting or other electrical fixtures are placed so that all safety requirements are met.		
5. Display is located in an area where it does not block exits or entrances.		
6. Display is free of sharp edges or corners.		
7. Display does not include lighting or other display techniques that deliberately present a false impression of the merchandise.		
8. Merchandise used is clean and fresh.		
9. Showcards or price tags are informative, free of errors, dirt, and smudges.		
10. Similar and related items are grouped together.		
11. Prices are placed for easy reading for customer.		
12. Shelves and tables are free of dust and plant debris.		
13. Props do not distract attention from the merchandise displayed.		

All items must be rated acceptable.

Student Competency Sheet

Duty XIII: MERCHANDISING

Module C: Displaying Merchandise

Task 2: DESIGN AND LOCATE SPECIAL INDOOR DISPLAYS

Performance Checklist

1. Write a plan for the display including:
   a. The theme or purpose.
   b. A list of the merchandise to be used.
   c. A list of the display accessories and tools.
   d. A list of show/price cards to be used.
2. Draw a sketch of how the display will appear when finished.
3. Letter show/price cards.
4. Assemble tools, merchandise, props and accessories at work area.
5. Select a display area with the following features:
   a. Easy access.
   b. Free of hazards.
   c. High visibility.
6. Set up display incorporating the following principles of display:
   a. Balance
   b. Harmony
   c. Color and texture
   d. Scale and proportion
   e. Space
   f. Focal area
   g. Repetition
   h. Unity

Test

Items Needed:
1. Table arrangements
2. Display props
3. Show/price cards
4. Centerpieces
5. Novelty arrangements
6. Lettering pen
7. Cleaning supplies

Task: Design, locate and set-up indoor displays.

Standard:
1. The completed display must have eye-appeal and incorporate the principles of floral design.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Review pp. 449-454, Retail Merchandising.

2. Answer/discuss these questions:

   a. What is an open display?
   b. What is a dump display?
   c. Would a florist ever use a dump display?
   d. What is the purpose of an end display?
   e. Why would a florist use a closed display?

3. Repair an unsteady leg on a display table.

4. Apply a fresh coat of paint to display props.

5. Practice lettering show cards for an indoor display. Suggest some possible uses for the merchandise in your display, such as:

   "Makes a lovely centerpiece"
   "Brighten a kitchen window"
   "Thank a neighbor with a plant"

6. Arrange a special holiday display of poinsettias or Easter lilies.

   a. Explain to your instructor where you would locate the display in a floral shop (one in your locale).
   b. Have your instructor evaluate your work.

PERFORMANCE CHECK SHEET:

ACTIVITY: Design and Locate Special Indoor Displays	Rating	
	ACCEPTABLE	UNACCEPTABLE
THE DISPLAY: 1. Attracts the attention of customers.		
2. Exhibits the following principles of display: a. Balance b. Harmony c. Color and texture d. Scale and proportion e. Shape f. Focal area g. Repetition h. Unity		
3. Exhibits the following safety standards: a. Props are structually designed to safely support displayed merchandise.		
b. Placement of merchandise is arranged so that no safety hazards exist		
c. Lighting or other electrical fixtures are placed so that all safety requirements are met.		
d. Materials used in display are fire resistant.		
e. Display is located in an area where it will not block exits or entrances.		

PERFORMANCE CHECK SHEET (continued):

	ACCEPTABLE	UNACCEPTABLE
f. Display is free of sharp edges and corners.		
4. Does not include lighting or other display techniques that deliberately present a false impression of the merchandise.		
5. Includes merchandise in the display that is clean and fresh.		
6. Is designed around a definite theme or purpose.		
7. Includes showcards or price tags that are informative, free of errors, dirt, smudges, and follow the purpose or theme of the display.		
8. Display props do not distract attention from the displayed merchandise.		

Student Competency Sheet

Duty XIII: MERCHANDISING

Module C: Displaying Merchandise

Task 3: DESIGN AND LOCATE OUTDOOR DISPLAYS

Performance Checklist

1. Write a plan for the display including:
    a. The theme or purpose
    b. A list of the merchandise to be used
    c. A list of the display accessories to be used
    d. A list of the show/price cards to be used
    e. A list of the tools and supplies to be used.
2. Draw a sketch of how the display will appear when finished.
3. Write a copy and hand letter show/price cards to be used.
4. Assemble tools, merchandise, props and accessories at the working area.
5. Using plans and sketch set up the display incorporating the following principles of display:
    a. Balance
    b. Harmony
    c. Color and texture
    d. Scale and proportion
    e. Shape
    f. Focal area
    g. Repetition
    h. Unity
6. Incorporate the following safety standards in the display:
    a. Design the props to safely support all displayed merchandise.
    b. Place all merchandise in the display so that all hazards are avoided.
    c. Place all electrical and lighting fixtures so that all safety requirements are met.
    d. Use only fire-resistant accessory materials in the display.
    e. Avoid placing the display in an area that will block exits or entrances.
    f. Avoid having sharp edges and corners in the display.
7. Set up the display avoiding the use of lighting or other display techniques that will present a false impression of the merchandise.
8. Use only fresh and clean merchandise, props, and accessories.
9. Build the display around the theme or purpose.
10. Use show and price cards that are informative, free of errors, dirt, and smudges, and ones that follow the purpose or theme of the display.

Test

Items Needed: 1. Display props
2. Show/price cards
3. Merchandise suitable for outdoor display

4. Waterproof lettering pens or markers
5. Spray paint
6. Heavy duty stapler and staples

Task: Design, locate and set up outdoor display.

Standard:
1. The completed display must attract the customer's attention and be able to withstand the elements (wind, rain, etc.).
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Make a Christmas garland to decorate the front of a shop by tying pine boughs to heavy cord. Drape the garland around window and door frames and fasten with a heavy-duty stapler.

2. Arrange a group of shade-loving hanging baskets in an outdoor shadehouse in the spring.

3. Locate a site to display an eight (8) foot Christmas tree:

   a. Mount the tree in a stand and anchor it securely to prevent wind damage or vandalism. Or use a balled and burlapped live tree.
   b. Decorate the tree using waterproof blinking lights and natural materials.
   c. Spray-paint pine cones white and allow to dry before decorating tree.
   d. String cranberries and holly berries to decorate your outdoor tree.

4. Design an outdoor display for Halloween:

   a. Include pumpkins, cornstalks, autumn leaves and potted mums.
   b. Carve a jack o' lantern from a pumpkin.
   c. Design a scarecrow, using cornstalks and old clothes, to serve as a focal point in your display.
   d. Have your instructor evaluate your display, using Performance Check Sheet XIII-C-3.

PERFORMANCE CHECK SHEET:

DESIGN AND LOCATE OUTDOOR DISPLAYS	Rating	
	ACCEPTABLE	UNACCEPTABLE
The display:		
1. Attracts the attention of customers.		
2. Exhibits the following principles of display:		
a. Balance		
b. Harmony		
c. Color and texture		
d. Scale and proportion		
e. Shape		
f. Focal area		
g. Repetition		
h. Unity		
3. Exhibits the following safety standards:		
a. Props are structually designed to safely support displayed merchandise		
b. Placement of merchandise is arranged so that no safety hazards exist.		
c. Lighting or other electrical fixtures are placed so that all safety requirements are met.		

PERFORMANCE CHECK SHEET (continued):

	ACCEPTABLE	UNACCEPTABLE
d. Materials used in display are fire resistant.		
e. Display is located in an area where it does not block exits or entrances.		
f. Display is free of sharp edges and corners.		
4. Does not include lighting or other display techniques that deliberately present a false impression of the merchandise.		
5. Includes merchandise in the display that is clean and fresh.		
6. Is designed around a definite theme or purpose.		
7. Includes showcards or price tags that are informative, free of errors, dirt, and smudges, and follow the purpose or theme of the display.		
8. Props do not distract attention from the merchandise displayed.		

Student Competency Sheet

Duty XIII: MERCHANDISING

Module D: Maintaining Customer Relations

Task 1: PROVIDE INFORMATION TO CUSTOMER OR RECIPIENT

Performance Checklist

1. Select a floral product typically sold in a retail flower shop.
2. Collect product information from:
   a. Observations of the merchandise itself
   b. Resource books
   c. Experienced sales people
   d. Flower or plant growers
3. Organize the information that you feel the customer will want to know:
   a. Uses
   b. Growth habits
   c. Environmental needs
   d. Price

Test

Items Needed:
1. Resource and care books
2. Price lists
3. Catalogs
4. Tape recorder

Task: Given a customer's need for information, answer all questions.

Standard:
1. Customer's need for information must be answered thoroughly and knowledgeably in a patient, friendly manner.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Read:

   a. Pages 520-525, Retailing Principles and Practices.
   b. Pages 384-387 and 388-395, Retail Merchandising.
   c. Pages 116-121, Retail Flower Shop Operation and Management.

2. You will need a tape recorder and a partner to role-play a customer who is interested in African violets; you will be the florist.

   a. Advise the customer about the plant's growth habits and environmental needs.

  b. Play back the tape: ask the class to discuss the strengths and weaknesses in the presentation.
  c. Record the same role-play situation again, with a different "customer."
  d. Play back the tape: ask the class to compare your first and second sales efforts.

3. Your customer (who bought the African violets in Learning Activity 2) has returned. The plants died and he/she wants a refund because the plants, which were bought last year, have died. He/she is quite angry.

  a. Have at least two other classmates evaluate your performance with the customer.
  b. Explain to the customer (a classmate) why you cannot offer one-year guarantees on plants.

4. Select another partner. This partner will be a customer who wants to buy several foliage plants for home decorating:

  a. Let the customer make selections of merchandise as you explain the benefits and care of each item.
  b. Have your instructor evaluate your performance (Performance Check Sheet XIII-D-1.) Discuss the evaluation.

PERFORMANCE CHECK SHEET:

ACTIVITY:	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Greeted customer upon entry into shop.		
2. Smiled and was pleasant and courteous to customer.		
3. Brought out one item of merchandise at a time for customer examination.		
4. When discussing plants and flowers, used their common names and varieties except when customer requested botanical names.		
5. Suggested several uses for product.		
6. Listened to customer carefully without interruption or impatience.		
7. Attempted to satisfy needs of customer in honest manner.		
8. Spoke in soft, well-modulated voice.		
9. Made positive suggestions and avoided negatives.		
10. Did not hurry the customer, but completed the sale in a reasonable amount of time.		
11. Did not try to oversell any product or service.		

Student Competency Sheet

Duty XIII: MERCHANDISING

Module D: Maintaining Customer Relations

Task 2: REGISTER SALE OF MERCHANDISE

Performance Checklist

1. Determine type of sale--cash or charge.
2. Write sales ticket for either cash or charge sale and include the following information:
   a. Date customer placed order.
   b. Code number if wire service order.
   c. Whether order is to be picked up or delivered.
   d. Date order will be picked up or delivered.
   e. Name, address, and phone number of person or company paying for order.
   f. Initials of salesperson.
   g. Type of sale--cash or charge.
   h. Description of merchandise.
   i. Message for enclosure card.
   j. Total cost of order.
   k. Name and address of person receiving order.
   l. Customer's signature on charge sale.
3. For cash sales:
   a. Enter amount of sale, and tax, on cash register.
   b. Accept payment and place on cash register shelf.
   c. Count change aloud as it is returned to customer.
   d. Place money in cash register.
   e. Give receipt to customer.
   f. Thank customer.
4. For charge sales:
   a. Verify charge authorization with manager if purchase price exceeds floor limit.
   b. Enter amount of sale, and tax, on cash register.
   c. Ask customer to sign charge plate sales ticket.
   d. Place sales ticket and charge card in imprinter and process sales ticket.
   e. Return charge card to customer.
   f. Keep shop's copy of sales ticket.
   g. Give customer a copy of sales ticket.
   h. Thank customer.
5. Wrap the merchandise.
   Flower arrangements:
   a. Attach care card.
   b. Attach enclosure card.
   c. Place arrangement in tissue-lined paper box.
   d. Staple ends of tissue together.
   e. Tag package for delivery or customer carry-out.

Potted plants:
- a. Clean the pot.
- b. Dress the pot.
- c. Attach care card.
- d. Wrap double layer of tissue paper around bottom of pot. Avoid damaging plant's blooms.
- e. Fold paper over top of blooms and staple.
- f. Attach enclosure card.
- g. Tag wrapped plant for delivery or give to customer for carry-out.

Test

Items Needed:
1. Cash register and register tape
2. Sales tickets
3. Enclosure cards
4. Tissue paper
5. Boxes
6. Care cards
7. Stapler
8. Delivery tags
9. Sales tax chart

Task: Complete sale of merchandise by receiving payment, making change and wrapping order.

Standard:
1. Sales ticket must be filled out completely, accurately and legibly for record keeping, reordering, or customer complaints.
2. All items on Performance Check Sheet must be rated acceptable.

Learning Activities

1. Read:

   a. Pages 84-91, Retailing Principles and Practices.
   b. Pages 372-378, Retail Merchandising.

2. Read Volume III, Module FD-48, Retail Flower Shop Salesperson and Floral Designer. Then, on a form like the one shown in this chapter, practice writing sales checks for sales orders. Use the orders listed on Information Sheet XIII-D-2.

3. Watch a demonstration on how to ring up sales on a cash register.

4. Practice using the cash register.

5. Watch a demonstration on how to change the tape in a cash register.

6. Practice changing the register tape.

7. Attend a lecture-discussion on "opening" and "closing" the cash register for the day. Discuss:

   a. How much money (in change and bills) you should have to start a business day.
   b. What to do with money in the cash register at the end of a business day, including:
      (1) How to prepare money for the register for the next day.
      (2) How to prepare a bank deposit slip.

8. Practice making change:

   a. Use another student as the customer.
   b. Make change by giving the least number of coins or bills possible. For example:
      (1) A 60¢ sale from a $10 bill = one (1) nickle, one (1) dime, one (1) quarter, four (4) $1 bills, one (1) $5 bill.
      (2) A $1.06 sale from a $20 bill = four (4) pennies, one (1) nickle, one (1) dime, one (1) quarter, one (1) 1/2 dollar, three(3) $1 bills, one (1) $5 bill, one (1) $10 bill.
   c. Practice counting the change out to the customer as you place it in his/her hand.
   d. Discuss why you laid the customer's bill on top of the cash register drawer shelf until the sale was completed.
   e. Discuss why the customer must have a copy of the receipt.

9. Watch a demonstration on how to use a charge card imprinter.

10. Practice using the imprinter.

11. Attend a lecture-discussion on credit sales:

    a. What are the advantages of belonging to a credit card organization? What are disadvantages?
    b. How do credit card organizations work? How do you, as a retailer, join?
    c. How do you determine whether to extend credit to a cash customer? What are the advantages? Disadvantages?

12. Your instructor will "purchase" a floral product from you, along with several other items (plant food, container, etc.). Complete the sale in the following ways:

    a. Cash sale, using cash register
    b. Credit card sale
    c. Cash sale, using written receipt (no cash register)
    d. Credit sale (customer will be billed later)
    e. Wrap the merchandise, and include the enclosure card if required.
    f. Your instructor will evaluate your performance. (All appropriate steps of the Performance Checklist must be completed, and all items on the Performance Check Sheet must be rated acceptable.)

Information Sheet XIII-D-2

Sample Orders for Writing Sales Checks:

1. On November 17th, Mrs. Elaine Johnson of 436 Greenmountain Street, Morgantown, WV 26505, purchased a dried floral arrangement priced at $15.50. The sale is to be charged to Mrs. Johnson's account at the store.

2. On February 12th, Mr. Robert Bruce of 1791 Locust Drive, Huntington, WV 25701, called in an order for one (1) dozen sweetheart roses to be wired to his wife for Valentine's Day. Mrs. Bruce is visiting her mother in Columbus, Ohio, and the wire order has been sent to Oakwood Florists, Inc., in Columbus on February 13th. The wire service price is $25, plus tax. The card is to read, "Happy Valentine's Day, Love, Bob."

3. On July 19th, Mrs. Marian Dorchester, of 23 Preston Street, Shady Spring, WV 25918, purchased a new baby arrangement to be sent to her daughter-in-law, Mrs. Helen Dorchester at Beckley Hospital. It is a cash sale for $10.75 and the card is to read "Congratulations to both of you, Love, Grandma." The hospital only accepts floral deliveries from 9:00 to 11:00 a.m. daily.

4. On April 29th, Jim Richmond of 9624 Pennington Road, Charleston, WV 25301, called in an order for a funeral spray to be sent to Whitman's Funeral Home, 1741 Grand Avenue, Charleston, for his deceased friend, Harry Kramer. The funeral is scheduled for 9:30 a.m. on May 2nd. The amount of the purchase is $25.00 and the card is to read, "With deepest sympathy, Members of Lodge 916."

PERFORMANCE CHECK SHEET:

ACTIVITY	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Determined the type of sale before writing the sales slip.		
2. Wrote sales slip legibly.		
3. Spelled all words, especially customer's name, correctly.		
4. Calculated price and sales tax without error.		
5. Secured customer's signature on charge sale.		
6. Counted change aloud to customer.		
7. Placed money on cash register drawer or shelf until customer accepted the change.		
8. Made change in least amount of coins and bills.		
9. Inserted cash in register and closed cash drawer.		
10. Wrapped purchase without damage to merchandise.		
11. Enclosure card was accurately and neatly written.		
12. Gave customer receipt for purchase.		
13. Thanked the customer.		
14. Sales transaction was accomplished without unnecessary delays, was "professionally" handled.		

Student Competency Sheet

Duty XIII: MERCHANDISING

Module D: Maintaining Customer Relations

Task 3: PLACE OR RECEIVE ORDERS THROUGH WIRE SERVICES

Performance Checklist

Placing Orders:

1. Write the customer's order on the specific wire service order pad.
2. Dial the wire service and relay the following information:
   a. Name and address of your shop and your name.
   b. Code number of your shop.
   c. Name and address of the florist to receive the order.
   d. Complete order, including the customer's second choice and purpose of the order (wedding, funeral, etc.).
   e. Name, address, and telephone number of the person to receive the merchandise.
   f. Message for the enclosure card.
   g. Requested time and date of delivery.
3. Have the wire service operator repeat the entire order back to you.
4. Ask for and record (on the order form) the name of the person taking your order. Record also, the date and time of the phone call.
5. File the order.

Receiving Wire Service Orders:

1. Write the customer's order on the specific wire service order pad:
   a. Name, address, and telephone number of the person to receive the merchandise.
   b. Complete order, including the customer's second choice and purpose of the order (wedding, funeral, etc.).
   c. Message for the enclosure card.
   d. Requested time and date of delivery.
   e. Name and address of shop which placed the order, including code number.
   f. Time and date of order; wire service order number.
2. Read the entire order back to the operator.
3. Ask for and record (on the order form) the name of the person giving the order.
4. Process the order.
5. File the order form.

Test

Items Needed:
1. Wire service florist directory
2. Telephone
3. Order information
4. Tape recorder

Task: Place or receive floral orders through wire services.

Standard:
1. Process wire service orders so that the customer's order is filled, according to merchandise, message, and delivery information.
2. All items on the Performance Check Sheet must be rated acceptable.

Learning Activities

1. Read:
   a. Volume III, Modules FD-46 and FD-47, Retail Flower Shop Salesperson and Floral Designer.
   b. Pages 121-122, Retail Flower Shop Operation and Management.

2. Practice placing and receiving orders over the telephone. Then, discuss:
   a. Whether all necessary information was exchanged.
   b. How to improve your telephone sales skills.

3. Attend a lecture-discussion on wire services. Discuss:
   a. The major wire services--advantages and disadvantages of subscribing to each.
   b. How payment is made to or received through wire services.

4. Visit a local florist. Observe and discuss:
   a. Ordering through a wire service for delivery in another location.
   b. Filling orders placed by out-of town florists.
   c. Procedures used for processing the orders.
   d. Use of the wire service order catalog.

5. Read the major sections of a wire service directory of participating florists. Then, discuss:
   a. The number of cities offering this service.
   b. Instructions for placing and receiving orders.
   c. Instructions for making and receiving payments for wire service orders.

6. With three partners, practice placing a wire service order:
   a. Partner #1 (Ms. or Mr. Blank) enters your shop early Monday morning. A favorite uncle has died in Tucson, Arizona. You are to help this customer decide on what kind of floral tribute would be best (basket, etc. for the funeral home or arrangement for the wife and family of the deceased uncle). She/he is obviously upset and having trouble making a decision.
      (1) Help the customer make the decision.
      (2) Write the order and make arrangements for payment.

b. As you finished taking the order from Ms./Mr. Blank, you receive a telephone call from Ms./Mr. Hoo. A granddaughter in McKeesport, Pennsylvania, has just given birth to a son, and Ms./Mr. Hoo wants to send an appropriate arrangement to the hospital. (Partner #2 will be Ms. or Mr. Hoo.)
   (1) Get all the necessary information on the telephone.
   (2) Write the order and make arrangements for payment.
c. Partner #3 will be the wire service operator. Place the order to the operator. Record the order on tape.

7. With a partner, practice receiving a wire service order from another city.

   a. Have your partner be the operator placing the call; you will be the florist receiving the order.
   b. Record the call on tape.
   c. Process the order.

8. Play back the tapes from Learning Activities 6 and 7:

   a. Have the class rate the taped calls, using the Performance Check Sheet.
   b. Your instructor will evaluate your performance.

PERFORMANCE CHECK SHEET:

ACTIVITY: PLACING WIRE SERVICE ORDERS	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Specified the name of the wire service.		
2. Gave the name, address and telephone number of the calling florist.		
3. Gave the code number of the calling florist.		
4. Gave the order, second choice, and price range requested by customer.		
5. Gave the name, address and telephone number of the person who is to receive the order.		
6. Gave the name and address of the florist to receive the order.		
7. Gave the message to be written on the enclosure card.		
8. Specified the delivery date for the order.		
9. Asked for and recorded the name of the person taking the order.		
10. Asked wire service order-taker to repeat the order.		

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PERFORMANCE CHECK SHEET:

ACTIVITY: RECEIVING WIRE SERVICE ORDERS	Rating	
	ACCEPTABLE	UNACCEPTABLE
1. Obtain name, address, telephone number of person to receive merchandise.		
2. Obtained merchandise information for filling order.		
3. Obtained message to be written on enclosure card.		
4. Obtained information on shop which placed order, including code number.		
5. Obtained delivery information (date, time).		
6. Repeated order to operator. (Verified order information.)		
7. Recorded date and time order was received.		
8. Recorded operator's name.		
9. Processed order immediately.		

Student Competency Sheet

Duty XIII: MERCHANDISING

Module D: Maintaining Customer Relations

Task 4: DELIVER MERCHANDISE

Performance Checklist

1. Read map to locate addresses provided on delivery slips.
2. Group deliveries going to same geographical area.
3. Using map, list deliveries in most direct, logical order.
4. Consider the following in writing route sheet:
   a. Customer's requested time of delivery
   b. Closing hours of business
   c. Traffic patterns
   d. Limited delivery schedules for hospitals and funeral homes
   e. Care needs of plants and flowers
5. Write plan legibly and completely for easy reading by delivery person.
6. Pack merchandise into vehicle.
7. Deliver merchandise.

Test

Items Needed:
1. Area maps
2. Delivery slips
3. Delivery Route Sheet
4. Flashlight (for after-dark delivery)
5. Merchandise to be delivered

Task: Deliver merchandise to customer or recipient.

Standard: Merchandise must be delivered on time, on the date requested, in good condition, by way of the most direct route.

Learning Activities

1. Read pp. 132-133, Retail Flower Shop Operation and Management.

2. Review the procedures for wrapping and packing floral merchandise.

3. Each person in the class will prepare two delivery order slips:

   a. Using these order slips, plan the most direct delivery route. Avoid back-tracking and wasted time.
   b. Estimate the total time required to make the deliveries, based on mileage, number of stops, traffic patterns, and special delivery hours at hospitals, funeral homes, places of business, etc.

4. With the class, discuss:

   a. Why the personal appearance of the delivery person is important.
   b. Whether the delivery person should be responsible for collecting payment for merchandise delivered.
   c. Ways in which the delivery person's work patterns and behavior can affect:
      (1) Customer relations
      (2) Company profits
      (3) Vehicle insurance rates
      (4) Condition of merchandise

5. Design a Delivery Route Sheet for use in your floral shop.

6. Use the Delivery Route Sheet, a local map, and a list of "deliveries" provided by your instructor:

   a. Plan the most direct order for making the deliveries.
   b. Complete the Delivery Route Sheet form.
   c. Compare and discuss the delivery route you proposed.

7. Review the procedures for wrapping and packing floral merchandise.

8. Each person in the class will prepare two delivery order slips. Then, by yourself, perform the following activities:

   a. Using these order slips, plan the most direct delivery route. Avoid back-tracking and wasted time.
   b. Estimate the total time required to make the deliveries, based on mileage, number of stops, traffic patterns, and special delivery hours of hospitals, funeral homes, places of business, etc.
   c. Complete a Delivery Route Sheet, indicating the order in which the deliveries are to be made and the estimated time of delivery.
   d. Have your instructor evaluate your plan.